MasterPacT™ MTZ

Circuit Breakers and Switches

Catalog

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www.se.com

Schneider Electric

Legal Information

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MasterPacT™ MTZ Selection

Introduction to MasterPacT MTZ Devices

MasterPacT MTZ circuit breakers bring smart connectivity and remote monitoring to power distribution systems:

- Smartphone connectivity allows easy access to device information.
- A Class 1 power meter is built in for energy-saving capabilities.
- Can be customized by adding digital modules.
- Has the new MicroLogic™ X control unit.
- Integrates seamlessly with building and energy management systems.

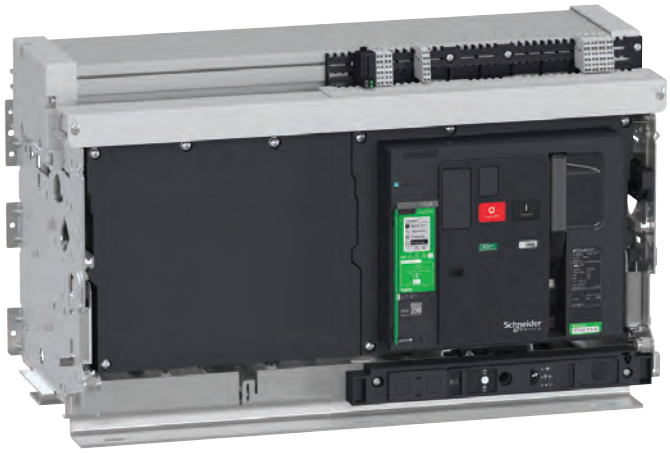
MasterPacT MTZ Circuit Breaker Overview

MasterPacT MTZ circuit breakers are available in three sizes.

MasterPacT MTZ1
800–1600 A

MasterPacT MTZ2[1]
800–4000 A

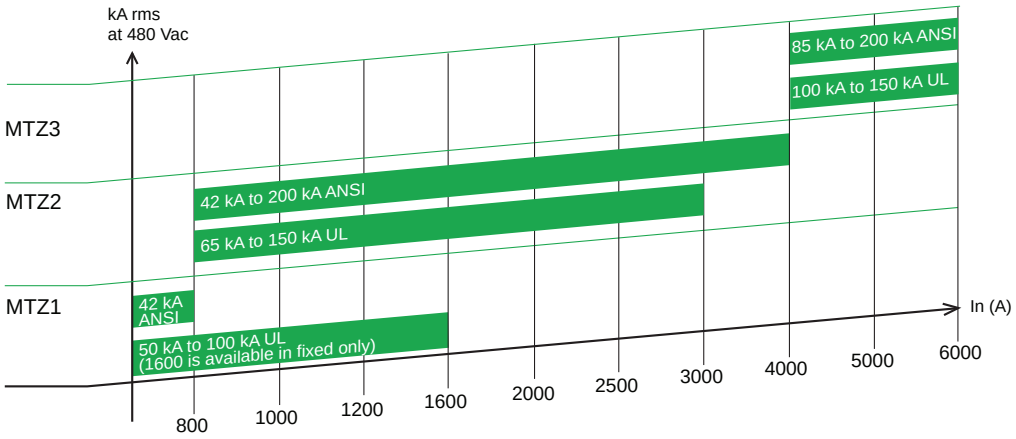
MasterPacT MTZ3
4000–6000 A



MasterPacT MTZ circuit breakers provides a full range of different breaking ratings.

- Insulated case devices are listed to UL489 and CSA C22.2 No 5.
- Power circuit breakers are certified to ANSI C37 (UL1066) and CSA C22.2 No 268.

1. 4000 A MTZ2 is not available in L1 interrupting rating code or drawout construction.



MasterPacT MTZ with ArcBlok™ Technology

The MasterPacT MTZ2 and MTZ3 low-voltage power circuit breaker and insulated case circuit breaker are available with ArcBlok technology designed to mount in an ArcBlok drawout cradle.

The MasterPacT MTZ with ArcBlok technology interfaces with the ArcBlok cradle to prevent arcing events by enclosing the phases at the primary connection of the cradle. If for any reason an arcing event happens, with the separation between phase to phase and phase to ground, the arc is extinguished in less than 12 ms to reduce arc flash energy.

Selecting MasterPacT MTZ Circuit Breakers

Selecting MasterPacT MTZ1 Circuit Breakers

NOTE: Throughout this catalog, UL489 means UL489/CSA C22.2 No 5 and ANSI C37 means ANSI C37/CSA C22.2 No 268.

Ratings for UL489 MasterPacT MTZ1 Circuit Breakers															
Frame Rating		**800 A**					**1200 A**					**1600 A[2]**			
Interrupting Rating Code		N	H	L1	L	LF	N	H	L1	L	LF	N	H	L1	L
Number of poles		3/4													
Interrupting Current (kAIR)	240 Vac, 60 Hz	50	65	100	200	200	50	65	100	200	200	50	65	100	200
	480 Vac, 60 Hz	50	50	65	100	100	50	50	65	100	100	50	50	65	100
	600 Vac, 60 Hz	35	50	—	—	—	35	50	—	—	—	35	50	—	—
Short-Time Withstand Current Rating (kA)	Vac 60 Hz, 0.5 s	35	35	10	10	10	35	35	10	10	10	35	35	10	10
Built-In Instantaneous Override (Peak kA ±10%)		90	90	22	22	22	90	90	22	22	22	90	90	22	22
Close and Latch Ratings (Peak kA)	Vac 60 Hz	55	55	22	22	22	55	55	22	22	22	55	55	22	22
Tested to show arc flash hazard risk category as referenced by NFPA70E		—	—	—	—	Yes	—	—	—	—	Yes	—	—	—	—
Breaking Time		25 to 30 ms (with no intentional time delay) 9 ms for L and LF													
Closing Time		< 50 ms													
Sensor Rating		400–800 A					600–1200 A					800–1600 A			
Endurance Rating (C/O Cycles) (with no maintenance)	Mechanical	12,500													
	Electrical	2,800													

Ratings for ANSI C37 Certified MasterPacT MTZ1 Circuit Breakers		
Frame Rating		**800 A**
Interrupting Rating Code		N1
Number of Poles		3/4
Interrupting Current (kAIR)	254 Vac 60 Hz	42
	508 Vac 60 Hz	42
	635 Vac 60 Hz	—
Short-Time Withstand Current (kA)	Vac 60 Hz, 0.5 s	42
Built-In Instantaneous Override (Peak kA ±10%)		—
Close and Latch Ratings (Peak kA)	Vac 60 Hz	90
Tested to show arc flash hazard risk category as referenced by NFPA70E		—
Breaking Time (with no intentional time delay)		25 to 30 ms
Closing Time		< 50 ms
Sensor Rating		400 to 800 A
Endurance Rating (C/O Cycles) (with no maintenance)	Mechanical	12,500
	Electrical	2800

2. Fixed-mounted only. 1600 A UL489 drawout circuit breakers are not available.

Ratings for IEC 60947-2 Rated MasterPacT MTZ1 Circuit Breakers									
Frame Rating			**800/1000 A**				**1250/1600 A**		
Interrupting Rating Code			H1	H2	H3	L1	H1	H2	H3
Ultimate Breaking Capacity (kA)	Icu	220/415 Vac, 50/60 Hz	42	50	65	150	42	50	65
		440 Vac, 50/60 Hz	42	50	65	130	42	50	65
		525 Vac, 50/60 Hz	42	42	—	100	42	42	—
		690 Vac, 50/60 Hz	42	42	—	25	42	42	—
		1150 Vac, 50/60 Hz	—	—	—	—	—	—	—
Service Breaking Capacity (kA)	Ics	%Icu	100%	100%	75%	100%	100%	100%	75%
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 1 s	42	42	50	10 x In	42	42	50
Built-In Instantaneous Override (kA ±10%)			—	90	110	10	—	—	110
Rated Making Capacity (Peak kA)	Icm	220/415 Vac, 50/60 Hz	88	105	145	330	88	105	145
		440 Vac, 50/60 Hz	88	105	145	286	88	105	145
		525 Vac, 50/60 Hz	88	88	—	200	88	88	—
		690 Vac, 50/60 Hz	88	88	—	52	88	88	—
		1000 Vac, 50/60 Hz	—	—	—	—	—	—	—
Breaking Time		ms	25 to 30 ms (with no intentional time delay) 9 ms for L and LF						
Closing Time		ms	50						
Sensor Rating			400 to 800 A						
Endurance Rating (C/O cycles) (with no maintenance)		Mechanical	12,500	12,500	10,000	12,500	12,500	12,500	10,000
		Electrical 440 V	6000	6000	6000	3000	6000	6000[3]	6000[3]
		Electrical 1000 V	—	—	—	—	—	—	—

3. 1600 A at 690 V is 3000 electrical operations.

Selecting MasterPacT MTZ2 Circuit Breakers

Ratings for UL489 MasterPacT MTZ2 Circuit Breakers[4]								
Frame Rating		**800/1200/1600/2000 A**				**2500/3000 A**	
Interrupting Rating Code		N	H	L	LF	H	L
Number of Poles		3/4					
Interrupting Current (kAIR)	240 Vac 50/60 Hz	65	100	200	200	100	200
	480 Vac 50/60 Hz	65	100	150	150	100	150
	600 Vac 50/60 Hz	50	85	100	100	85	100
Short-Time Withstand Current (kA)	Vac 50/60 Hz, 0.5 s	42	65	30[5]	22	65	65
Built-In Instantaneous Override (Peak kA ±10%)		90	90	80	55	150	150
Close and Latch Ratings (Peak kA)	Vac 50/60 Hz	90	90	55[6]	50	90	90
Tested to show arc flash hazard risk category (NFPA70E)		—	—	—	Yes	—	—
Breaking Time		25 to 30 ms (with no intentional delay) 9 ms for L and LF					
Closing Time		70 ms					
Sensor Rating		400–800 A / 600–1200 A / 800–1600 A / 1000–2000 A				1200–2500 A / 1600–3000 A	
Endurance Rating (C/O Cycles) (with no maintenance)	Mechanical	12,500[7]	12,500[7]	12,500[7]	12,500[7]	10,000	10,000
	Electrical	2800[7]	2800[7]	2800[7]	2800[7]	1000	1000

Ratings for ANSI C37 Certified MasterPacT MTZ2 Circuit Breakers[4]																
Frame Rating		**800/1600 A**						**2000 A**					**3200/4000 A[8]**			
Interrupting Rating Code		N1	H1	H2	H3	L1[9 10]	L1-F[10]	H1	H2	H3	L1[9 10]	L1F[10]	H1	H2	H3	L1[9 10]
Number of Poles		3/4														
Interrupting Current (kAIR) (50/60 Hz)	254 Vac	42	65	85	100	200	200	65	85	100	200	200	65	85	100	200
	508 Vac	42	65	85	100	200	200	65	85	100	200	200	65	85	100	200
	635 Vac	42	65	85	85	130	130	65	85	85	130	130	65	85	85	130
Short-Time Withstand Current (kA) (50/60 Hz)	Vac, 0.5 s	42	65	85	85	30	22	65	85	85	30	22	65	85	85	100
Built In Instantaneous Override (Peak kA ±10%)		—	—	—	190	80	55	—	—	190	80	55	—	—	190	270
Close and Latch Ratings (Peak kA)	Vac (50/60 Hz)	90	150	90	90	55	50	15-0	90	90	55	50	150	90	90	90
Tested to show arc flash hazard risk category (NFPA70E)		—	—	—	—	—	Yes	—	—	—	—	Yes	—	—	—	—
Breaking Time		25 to 30 ms (with no intentional delay) 9 ms for L1 and L1F														
Closing Time		70 ms														
Sensor Rating		400–800 A, 800–1600 A						1000–2000 A					1600–4000 A			
Endurance Rating (C/O Cycles) (with no maintenance)	Mechani-cal	12,500						10,000					10,000			5000

4. Also available in ArcBlock construction.
5. 65 kA for 2000 A.
6. 90 kA for 2000 A.
7. The endurance rating for 2000 A, N/H/L/LF is 10,000 for mechanical and 1000 for electrical.
8. 4000 A MTZ2 circuit breakers are not available in L1 interrupting rating code or in drawout construction.
9. Interrupting ratings (kAIR) at 50 Hz: 200 kA (254 Vac), 150 kA (508 Vac), 100 kA (635 Vac).
10. The interrupting ratings L1 and L1F are available only in 3P, drawout construction.

Ratings for ANSI C37 Certified MasterPacT MTZ2 Circuit Breakers[11]					
Frame Rating		**800/1600 A**	**2000 A**	**3200/4000 A[12]**	
	Electrical	2800	1000	1000	1000

Ratings for IEC60947–2 Rated MasterPacT MTZ2 Circuit Breakers																	
Frame Rating			**800/1000/1250/1600 A**					**2000 A**						**2500/3200/4000 A**			
Interrupting Rating Code			**N1**	**H1**	**H2**	**L1**	**H10**	**N1**	**H1**	**H2**	**H3**	**L1**	**H10**	**H1**	**H2**	**H3**	**H10**
Ultimate Breaking Capacity (kA) 50/60 Hz	Icu	220/415 Vac	42	65	100	150	—	42	65	100	150	150	—	65	100	150	—
		440 Vac	42	65	100	150	—	42	65	100	150	150	—	65	100	150	—
		525 Vac	42	65	85	130	—	42	65	85	130	130	—	65	85	130	—
		690 Vac	42	65	85	100	—	42	65	85	100	100	—	65	85	100	—
		1150 Vac	—	—	—	—	50	—	—	—	—	—	50	—	—	—	50
Service Breaking Capacity (%)	Ics	% Icu	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 1 s	42	65	85	30	50	42	65	85	65	30	50	65	85	65	50
		Vac 50/60 Hz, 3 s	22	36	50	30	50	22	36	75	65	30	50	65	75	65	50
Built-In Instantaneous Override (Peak kA ±10%)			—	—	190	80	—	—	—	190	150	80	—	—	190	150	—
Rated making Current (Peak kA) 50/60 Hz	Icm	220/415 Vac	88	143	220	330	—	88	143	220	330	330	—	143	220	330	—
		440 Vac	88	143	220	330	—	88	143	220	330	330	—	143	220	330	—
		525 Vac	88	143	187	286	—	88	143	187	286	286	—	143	187	286	—
		690 Vac	88	143	187	220	—	88	143	187	220	220	—	143	187	220	—
		1150 Vac	—	—	—	—	105	—	—	—	—	—	105	—	—	—	105
Breaking Time		ms	25	25	25	10	25	25	25	25	25	10	25	25	25	25	25
Closing Time		ms	< 70					< 70						< 70			
Sensor Rating			400–800 A / 800–1600 A					1000–2000 A						1600–4000 A			
Endurance Rating (with no maint.) (C/O Cycles x 1000)		Mechanical	12.5					10						10			
		Electrical 440 V	10	10	10	3	—	8	8	8	3	3	—	5	5	1.25	—
		Electrical 1150 V	—	—	—	—	0.5	—	—	—	—	—	0.5	—	—	—	0.5

11. Also available in ArcBlock construction.
12. 4000 A MTZ2 circuit breakers are not available in L1 interrupting rating code or in drawout construction.

Selecting MasterPacT MTZ3 Circuit Breakers

Ratings for UL489 MasterPacT MTZ3 Circuit Breakers[11]			
Frame Rating		**4000/5000/6000 A**	
Interrupting Rating Code		H	L
Number of Poles		3/4	
Interrupting Current (kAIR)	240 Vac 50/60 Hz	100	200
	480 Vac 50/60 Hz	100	150
	600 Vac 50/60 Hz	85	100
Short-Time Withstand Current (kA)	Vac 50/60 Hz, 0.5 s	85	100
Built-In Instantaneous Override (Peak kA ±10%)		170	170
Close and Latch Ratings (Peak kA)	Vac 50/60 Hz	90	90
Tested to show arc flash hazard risk category (NFPA70E)		—	—
Breaking Time		25 to 30 ms (with no intentional delay) 9 ms for L	
Closing Time		70 ms	
Sensor Rating		2000–4000 A 2500–5000 A 3000–6000 A	
Endurance Rating (C/O Cycles) (with no maintenance)	Mechanical	5000	5000
	Electrical	1000	—

Ratings for ANSI C37 Certified MasterPacT MTZ3 Circuit Breakers [11]				
Frame Rating		**4000/500/6000 A**		
Interrupting Rating Code		**H2**	**H3**	**L1[12] [13]**
Interrupting Current (kAIR) (50/60 Hz)	254 Vac	85	100	200
	508 Vac	85	100	200
	635 Vac	85	85	130
Short-Time Withstand Current (kA) (50/60 Hz)	Vac, 0.5 s	85	85	100
Built In Instantaneous Override (Peak kA ±10%)		—	—	270
Close and Latch Ratings (Peak kA) (50/60 Hz)	Vac	170	170	90
Tested to show arc flash hazard risk category (NFPA70E)		—	—	—
Breaking Time		25 to 30 ms (with no intentional delay) 9 ms for L1		
Closing Time		70 ms		
Sensor Rating		2000–4000 A 2500–5000 A 3000–6000 A		
Endurance Rating (C/O Cycles) (with no maintenance)	Mechanical	5000		
	Electrical	1000		

11. Also available in ArcBlock construction to 5000 A.
12. Interrupting ratings (kAIR) at 50 Hz: 200 kA (254 Vac), 150 kA (508 Vac), 100 kA (635 Vac).
13. The interrupting ratings L1 are available only in 3P, drawout construction.

Ratings for IEC60947–2 Rated MasterPacT MTZ3 Circuit Breakers				
Frame Rating			**4000/5000/6300 A**	
Interrupting Rating Code			**H1**	**H2**
Ultimate Breaking Capacity (kA) 50/60 Hz	Icu	220/415 Vac	100	150
		440 Vac	100	150
		525 Vac	100	130
		690 Vac	100	100
		1150 Vac	—	—
Service Breaking Capacity	Ics	%Icu	100%	100%
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 1 s	100	100
		Vac 50/60 Hz, 3 s	100	100
Built-In Instantaneous Override (Peak kA ±10%)			—	117
Rated making Current (Peak kA) 50/60 Hz	Icm	220/415 Vac	220	330
		440 Vac	220	330
		525 Vac	187	286
		690 Vac	187	220
		1150 Vac	—	—
Breaking Time			25 ms	
Closing Time		ms	< 80	
Sensor Rating			2000–4000 A 2500–5000 A 3000–6000 A	
Endurance Rating (with no maint.) (C/O Cycles x 1000)		Mechanical	5	
		Electrical 440 V	1.5	1.5
		Electrical 1150 V	—	—

Selecting MasterPacT MTZ Switches

Selecting MasterPacT MTZ1 Switches

Ratings for ANSI C37 Certified MasterPacT MTZ1 Non-Automatic Switches		
Frame Rating		**800 A**
Withstand Rating Code		NA
Short-Time Withstand Current Rating (kA)	Vac 50/60 Hz, 0.5 s	42
Breaking Capacity (with external protection relay) (kA)	254 Vac, 60 Hz	42
	508 Vac, 60 Hz	42
	635 Vac, 60 Hz	NA

Ratings for IEC 60947-3 Rated Non-Automatic MasterPacT MTZ1 Switches				
Frame Rating			**800/1000 A**	**1250/1600 A**
Withstand Rating Code			HA	HA
Rated Making Capacity (Peak kA)	Icm	220/415 Vac, 50/60 Hz	75	75
		440 Vac, 50/60 Hz	75	75
		500/690 Vac, 50/60 Hz	75	75
		1000 Vac, 50/60 Hz	—	—
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 0.5 s	36	36
Breaking Capacity (kA at 690 Vac) (with external protection relay)	Icu	Maximum delay 350 ms	36	36

Selecting MasterPacT MTZ2 Switches

Ratings for ANSI C37 Certified MasterPacT MTZ2 Non-Automatic Switches						
Frame Rating		**800 A**	**1600 A**	**2000 A**	**3200 A**	**4000 A**
Withstand Rating Code		HA	HA	HA	HA	HA
Breaking Capacity with External Relay (kA), 50/60 Hz	254 Vac	65	65	65	65	65
	508 Vac	65	65	65	65	65
	635 Vac	65	65	65	65	65
Short-Time Withstand Current (kA) Vac 50/60 Hz, 0.5 s		65	65	65	65	65

Ratings for IEC 60947-3 Rated MasterPacT MTZ2 Non-Automatic Switches						
Frame Rating			**800/1000/1250/1600 A**		**2000 A**	**2500/3200/ 4000 A**
Withstand Rating Code			**NA**	**HA**	**HA**	**HA**
Rated Making Current 50/60 Hz (Peak kA)	Icm	220/415 Vac	88	145	145	145
		440 Vac	88	145	145	145
		500/690 Vac	88	145	145	145
		1150 Vac	—	—	—	—
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 1 s	42	66	66	66
Ultimate Breaking Capacity (with external protection relay) (kA)	Icu	Maximum Delay 400 ms	42	66	66	66

Selecting MasterPacT MTZ3 Switches

Ratings for ANSI C37 Certified MasterPacT MTZ3 Non-Automatic Switches			
Frame Rating		**4000 A**	**5000/6300 A**
Withstand Rating Code		**HA**	**HA**
Breaking Capacity with External Relay (kA), 50/60 Hz	254 Vac	85	85
	508 Vac	85	85
	635 Vac	85	85
Short-Time Withstand Current (kA) Vac 50/60 Hz, 0.5 s		85	85

Ratings for IEC 60947-3 Rated MasterPacT MTZ3 Non-Automatic Switches			
Frame Rating			**4000B/5000/6300 A**
Withstand Rating Code			**HA**
Rated Making Current (Peak kA)	Icm	220/415 Vac, 50/60 Hz	187
		440 Vac, 50/60 Hz	187
		500/690 Vac, 50/60 Hz	187
		1150 Vac, 50/60 Hz	—
Short-Time Withstand Current (kA)	Icw	Vac 50/60 Hz, 1 s	85
Ultimate Breaking Capacity (with external protection relay) (kA)	Icu	Maximum Delay 400 ms	85

MicroLogic X Control Unit

Overview of MicroLogic X Control Unit

Measurement

The MicroLogic X control unit provides energy management with embedded power metering certified to Class 1 accuracy.

Protection

The MicroLogic X control unit is the next generation of MicroLogic devices, providing advanced protection functions with a simplified offer of control units. It adds flexibility with dual protection settings and expandability using optional digital modules.

Maintenance & Diagnostics

For continuity of services and extended equipment life, the MicroLogic X control unit integrates extensive diagnostics and maintenance assistance.

Communication

- Access data locally, using the control units embedded human-machine interface (HMI). This digital display provides local viewing of power system operation and maintenance information.
- Access data remotely, using fast and robust communication options such as wireless or Ethernet. This provides remote access for circuit breaker control, monitoring, energy efficiency, and management.

Upgrade with Digital Modules

Function can be added with optional digital modules, such as:

- Under/over voltage
- Energy per phase
- Individual harmonics analysis
- MasterPacT operation assistance and much more.

Overview of Available MicroLogic X Control Unit Protection Functions

The MasterPacT MTZ protection functions included in the control unit provide overcurrent, short-circuit, and ground-fault protection.

An embedded power meter offers the measurement parameters required to optimize energy management.

The optional digital modules offer upgrades to the Protection, Measurement, and Maintenance & Diagnostics functions.

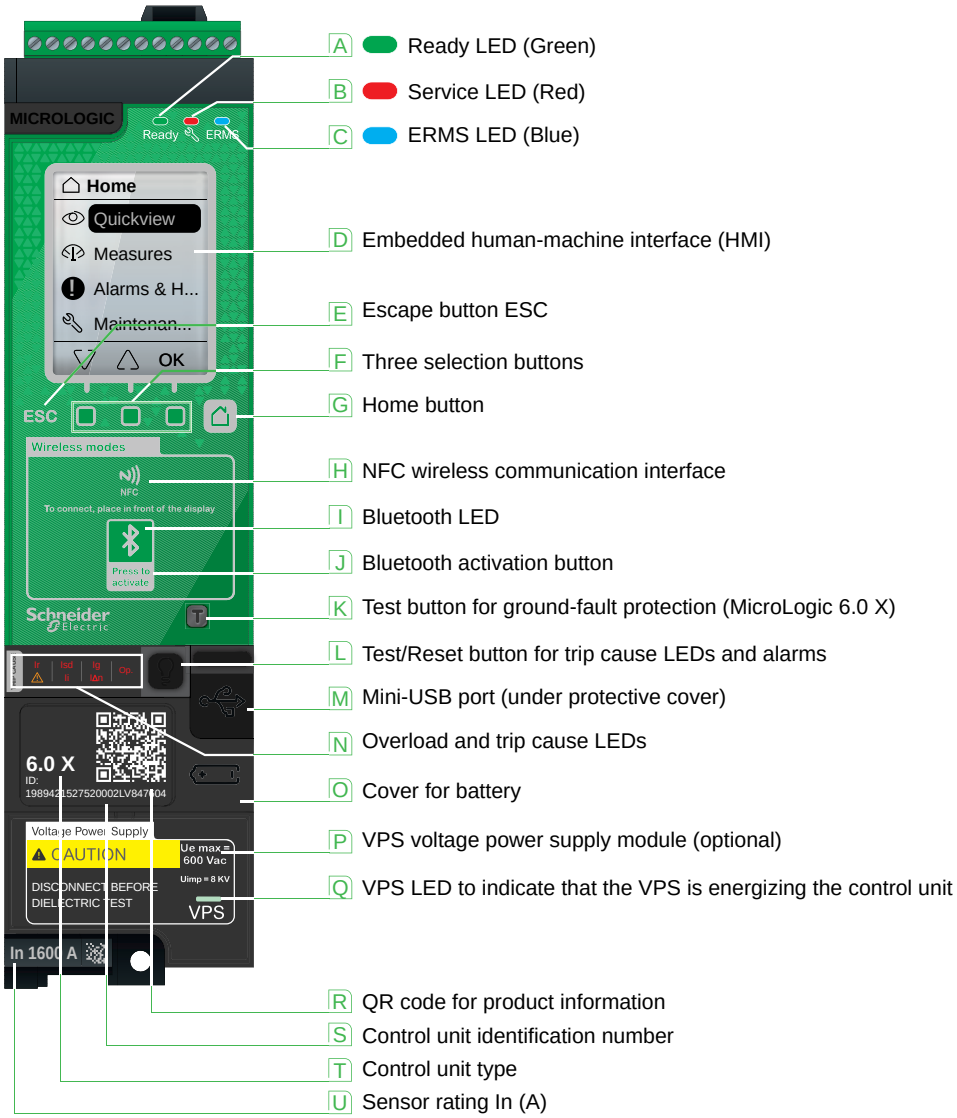
The information processed and stored by the MicroLogic X control unit is accessible by:

- The embedded human-machine interface (HMI) with colored backlight.
- Using smartphones via Bluetooth™ technology and near-field communication (NFC).
- Using an external personal computer (PC) through a universal serial bus (USB) connection.

Connection to Ethernet is achieved with dedicated interface modules: the Ethernet Interface (IFE) or the Embedded Ethernet Interface for Drawout MasterPacT MTZ device (EIFE).

Connection to the Modbus SL (RTU) is achieved with the Modbus Interface Module (IFM). For more information, consult Schneider Electric.

Layout of the MicroLogic X Control Unit



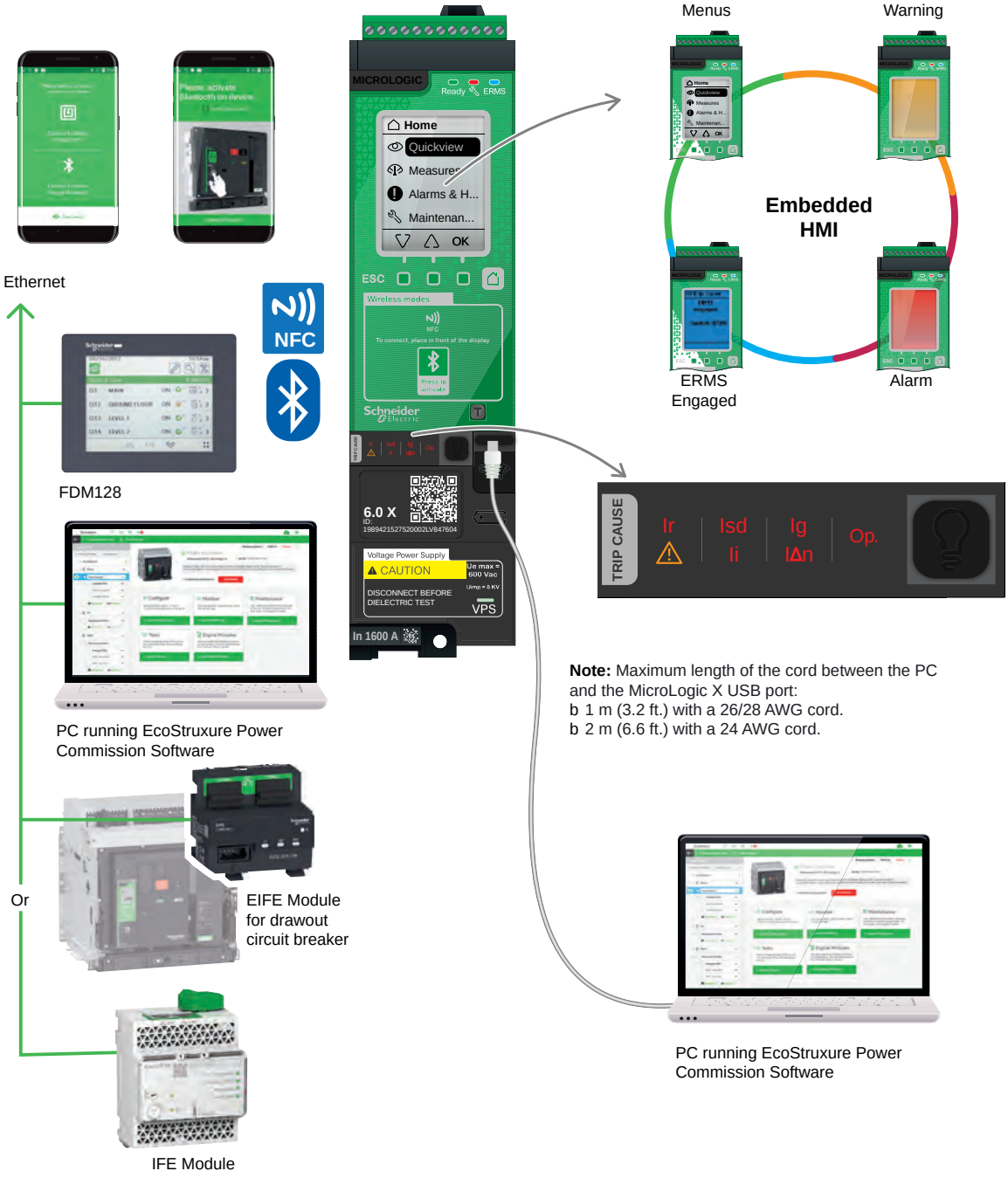
The MicroLogic X control unit's basic protection functions are on a dedicated circuit and processor that is protected from disturbances.

In-depth diagnostics allows users to follow the status and operating condition of the circuit breaker in real time.

The backlit display will change colors for various states, providing a clear indication when attention is needed.

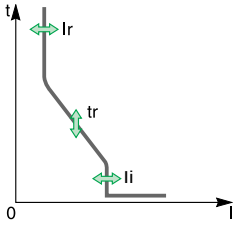
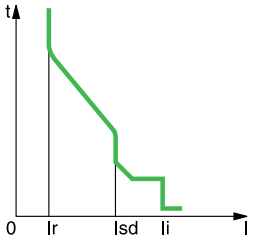
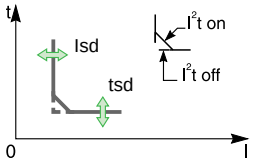
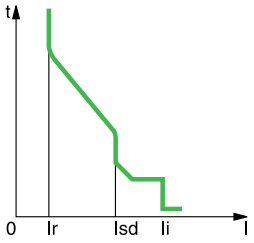
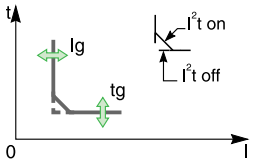
Information processed by the MicroLogic X control unit can be displayed on the embedded HMI, a smart device through Bluetooth technology or NFC, local front display (FDM128), communications such as Ethernet, and a PC through the USB connection.

MicroLogic X configuration is easily made through the EcoStruxure™ Power Commission Software.


Menus
Warning
Embedded HMI
ERMS Engaged
Alarm
Ethernet
NFC
FDM128
PC running EcoStruxure Power Commission Software
Or
EIFE Module for drawout circuit breaker
IFE Module
MICROLOGIC
Ready
ERMS
Home
Quickview
Measures
Alarms & H...
Maintenan...
OK
ESC
Wireless modes
Schneider Electric
6.0 X
Voltage Power Supply
CAUTION
DISCONNECT BEFORE DIELECTRIC TEST
VPS
In 1600 A
TRIP CAUSE
Ir
Isd
Ii
Ig
IΔn
Op.
Note: Maximum length of the cord between the PC and the MicroLogic X USB port:
b 1 m (3.2 ft.) with a 26/28 AWG cord.
b 2 m (6.6 ft.) with a 24 AWG cord.
PC running EcoStruxure Power Commission Software

MicroLogic X Control Unit Protection Functions

The MicroLogic X control unit is suitable for different systems of voltage, three or four wires up to 600 Vac, 50/60 Hz and for grounded systems.

MicroLogic 3.0 X	**LI:** Long time + Instantaneous		
MicroLogic 5.0 X	**LSI:** Long-time + Short-time + Instantaneous		
MicroLogic 6.0 X	**LSIG:** Long-time + Short-time + Instantaneous + Ground-fault		

Long-Time Overload Protection (ANSI 49RMS/51)

Long-time protection protects the conductors against overload currents. It is based on the true RMS current and is implemented independently for each phase and the neutral.

Thermal imaging is integrated into the long-time protection that models the heating and cooling cycles of the conductors.

Short-Time Short Circuit Protection (ANSI 50TD/51)

Short-time protection protects the installation against phase-to-phase, phase-to-neutral and phase-to-ground short circuits.

It is based on the true RMS current. It includes two characteristics depending on the status of the I^2t setting:

- When I^2t is OFF, a definite time characteristic is selected.
  The protection trips with the time delay tsd as soon as the setting current Isd is exceeded.
- When I^2t is ON, an inverse time characteristic is selected.
  The protection operates with the inverse time characteristic up to 10 x Ir and with a definite time characteristic above 10 x Ir.

Short-time adjustment may be used to improve selective coordination for the electrical system. Zone-selective interlocking (ZSI) interconnects multiple trip units to provide total coordination for short-time protection.

Instantaneous Short Circuit Protection (ANSI 50)

Instantaneous protection protects the installation against phase-to-phase, phase- to-neutral and phase-to-ground short circuits.

The protection operates with a definite time characteristic.

It trips without additional time delay when the setting current Ii is exceeded. The protection offers two selectable tripping times:

- Standard tripping time: 50 ms for applications requiring selectivity. Selectivity requires correctly sizing another circuit breaker installed downstream of the MasterPacT circuit breaker.
- Fast tripping time: 30 ms (used when selectivity is not required).

Ground-Fault Protection (ANSI 50N-TD/51N)

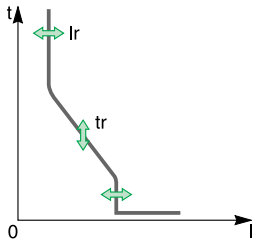
Ground-fault protection can be achieved in two ways:

- By performing the summation of the three phases and neutral currents.
- By means of an external sensor (Source Ground Protection [SGR][14]) installed around the cable connecting the transformer neutral point to ground. The SGR sensor is connected to the MicroLogic 6.0 X control unit through an MDGF interface module.

14. For SGR option please consult Schneider Electric.

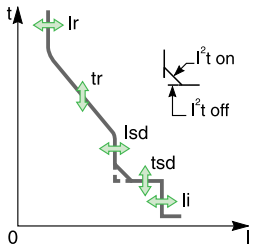
Protective Function Ratings

MicroLogic 3.0 X Control Unit



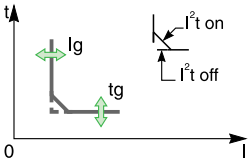
Long-Time	**ANSI Code 49RMS/51**									
Current setting (A)	**Ir** = In x …	**Ir** = 0.4 In to In, 1 A increments								
		Tripping between 1.05 and 1.2 x Ir								
Time setting		**tr** = 0.5 s to 24 s, step 0.5 s for 6 x Ir								
Time setting example: Time delay (s)	1.5 x Ir (+0/-30%)	12.5	25	50	100	200	300	400	500	600
	6 x Ir (+0/-30%)	0.5[15]	1	2	4	8	12	16	20	24
	7.2 x Ir (+0/-20%)	0.7[16]	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		After tripping based on thermal imaging model								
Instantaneous	**ANSI Code 50**									
Pick-up (A) (±10%)	**Ii**= In x …	**Ii** = 1.5 In to 12 In, 0.5 In increments[17]								
Operating time	Max resettable time:	20 ms					0 ms			
	Max breaking time:	50 ms					30 ms			

MicroLogic 5.0 X / 6.0 X Control Unit



Long-Time	**ANSI Code 49RMS/51**									
Current setting (A)	**Ir** = In x …	**Ir** = 0.4 In to In, step 1 A								
		Tripping between 1.05 and 1.20 Ir								
Time setting		**tr** = 0.5 s to 24 s, 0.5 s increments for 6 Ir								
Time setting example: Time delay (s)	1.5 x Ir (+0/-30%)	12.5	25	50	100	200	300	400	500	600
	6 x Ir (+0/-30%)	0.5[15]	1	2	4	8	12	16	20	24
	7.2 x Ir (+0/-20%)	0.7[16]	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		After tripping based on thermal imaging model								
Short-Time	**ANSI Code 50TD/51**									
Pick-up (A) (±10%)	**Isd** = Ir x …	**Isd** = 1.5 Ir to 10 Ir, 0.5 Ir increments[17]								
Time setting tsd (s)	Settings	I²t Off	0	0.1	0.2	0.3	0.4			
		I²t On	—	0.1	0.2	0.3	0.4			
Operating time at 10xIr	Max resettable time	20	80	140	230	350				
I²t Off or I²t On	Max break time	80	140	200	320	500				
Instantaneous	**ANSI Code 50**									
Pick-up (A) (±10%)	**Ii** = In x …	**Ii** = 2 to 15 In, 0.5 In increments, OFF protection[17]								
Operating time	Max resettable time:	20 ms					0 ms			
	Max breaking time	50 ms					30 ms			

15. +0/-40%
16. +0/-60%
17. Finer resolution settings are possible with EcoStruxure Power Commission Software and MasterPacT MTZ mobile App.

MicroLogic 6.0 X Control Unit								
	**Ground Fault**	**Ground Fault ANSI Code 50N-TD/51N**						
	Pick-up (A) (±10%)	**Ig** = In x …		**Ig** = 0.2 In to 1200 A[18], 0.1 In increments [19]				
	Time setting tg (s)	Settings	I²t Off	0	0.1	0.2	0.3	0.4
			I²t On	-	0.1	0.2	0.3	0.4
	Operating time (ms)	Non-tripping time		20	80	140	230	350
		Max breaking time		80	140	200	320	500

Additional MicroLogic X Control Unit Functions

Neutral Overload Protection on Four-Pole Circuit Breakers

A four-pole circuit breaker neutral protection is set remotely:

- Neutral protection set at unprotected.
- Neutral protection set at 0.5 x Ir.
- Neutral protection set at Ir.
  Neutral protection is greater than Ir, but lower than In and limited at 1.6 Ir phase.

For a three-pole circuit breaker used in a 4-wire circuit, the protection of the neutral requires an additional external neutral CT (ENCT). A long-time overcurrent characteristic is dedicated to the neutral protection.

Trip Coil Supervision (ANSI 74)

The MicroLogic X control unit continuously monitors the electrical continuity of the circuit breaker tripping coil. It generates an alarm if a problem is detected.

Lock-Out Function (ANSI 86)

If the circuit breaker is tripped from an overcurrent event or from one of the protective functions the circuit breaker is locked in the open position until it is reset manually or electrically. MasterPacT MTZ circuit breakers are also equipped with an interlocking function (see MasterPacT MTZ Locking and Interlocking Accessories, page 97).

Overcurrent Trip Indication (ANSI 94)

If the circuit breaker trips due to an overcurrent trip event or from a protection setting, the SDE contact will change state and signal the event. The SDE contact will stay closed until the circuit breaker is reset (seeOvercurrent Trip Indication Contacts (SDE), page 74 and Remote Reset After Overcurrent Trip, page 94).

18. 0.3 In to In for In ≤ 400 A
19. Finer resolution settings are possible with EcoStruxure Power Commission Software and MasterPacT MTZ mobile App.

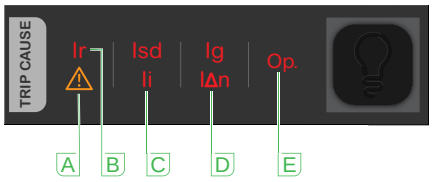
Dual Settings

The MicroLogic X control unit is equipped with dual protection settings which allow the user to have a second set of protection settings. This allows users to easily switch between settings.

A typical application is to adjust the short-circuit protection when an installation can be supplied by two sources (grid / generator set) with different levels of available short-circuit current. The settings can be selected by one of the following means:

- EcoStruxure Power Device App
- by a digital input through the IO module
- via Ethernet
- from the embedded HMI

Overcurrent and Trip Cause Indications



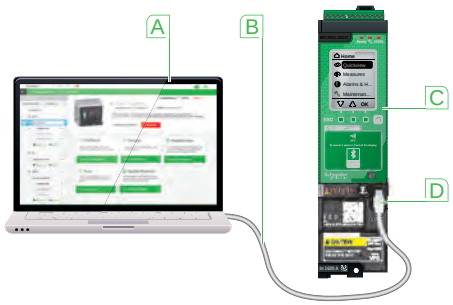
Five LEDs are available on the front of the MicroLogic X control unit.

A. The PreWarn/Warn LED is a bicolor LED with two functions:
   1. PreWarn/Warn LED changes to orange when I > 0.9 Ir
   2. Warn LED changes to red when I > 1.05 Ir
B. The **Ir** LED is dedicated to long time overload protection, it changes to red when the protection trips.
C. The **Isd/Ii** LED is dedicated to short-time and instantaneous short-circuit protection. It changes to red with a short-time or instantaneous overcurrent event.
D. The **Ig/IΔn** LED is dedicated to ground-fault protection. It changes to red when that protection trips.
E. The **Op.** LED is dedicated to the optional protections and changes to red when any of the optional protections trip.

The fault indication LEDs remains ON four hours after trip if not reset by the test/reset pushbutton. After four hours without reset it is possible to reactivate the trip indication LEDs by pushing the test/reset pushbutton. Under normal operating conditions, the battery supplying the LEDs has a service life of approximately 10 years.

The battery charge is continuously monitored.

Trip History



A PC running EcoStruxure Power Commission Software
B USB Cable
C MicroLogic X Control Unit
D USB Connector in Front

Trip history is captured and stored in the control unit, and can be retrieved and evaluated using Ecoreach™ software and the EcoStruxure Power Device App.

Each trip inside the trip history (except the last one) includes:

- Type of protection that caused the trip: long-time (overload), short-time (short-circuit), instantaneous (short-circuit), ground fault.
- Date and time of the fault.

The last 50 trip histories can also be retrieved by means of a PC running EcoStruxure Power Commission Software.

In addition, MicroLogic X control unit also logs:

- Last electrical values measured before the fault (voltages, currents, frequency, current and voltage unbalance levels),
- Tripping current during the fault just before the MasterPacT MTZ circuit breaker trip (phase, neutral and ground currents).
- Protection settings.

The last trip may be retrieved through the NFC powerless wireless communication while the circuit breaker is open and the MicroLogic X control unit is not energized.

Protection Settings and Checking

The protection settings can be set by means of the embedded display, a smartphone via Bluetooth technology, or with EcoStruxure Power Commission Software running on a PC.

EcoStruxure Power Commission Software allows:

- Setting and checking the protections.
- Downloading current settings and uploading new settings.
- Checking the circuit breaker operation.
- Retrieving and displaying information processed by the MicroLogic X control unit:
  - Measurements
  - Alarms
  - Warnings
  - Diagnostics
- Generating and storing reports.

Setting Change Traceability

Setting changes are recorded in the protection history, including:

- Date and the time of the last setting change.
- Previous settings and new settings.

The NFC wireless connection allows access to the active trip settings while the circuit breakers is Open and the MicroLogic control unit is not energized.

Setting Change Locking

The general configuration menu of the MicroLogic X control unit's embedded display allows:

- Enabling or disabling the protection setting change from the embedded display.
- Enabling or disabling the protection setting change from external access:
  - Smartphone via Bluetooth technology,
  - PC running EcoStruxure Power Commission Software,
  - Ethernet and Modbus SL (RTU) communication.

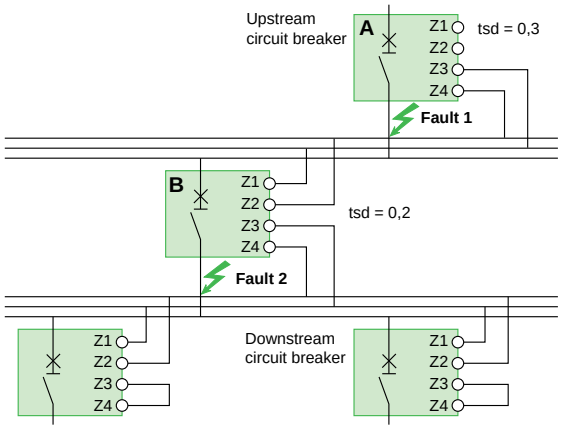
Zone-Selective Interlocking (ZSI)

ZSI is a system designed to reduce the stress on electrical distribution equipment during short-circuit or ground-fault conditions. It uses previously-coordinated protection to reduce the fault tripping time while maintaining selectivity. Each version of the MicroLogic X control unit includes the ZSI function. The ZSI function is associated with short-time short-circuit protection and ground-fault protection.

The control unit detecting a fault sends a signal upstream and checks for a signal arriving from downstream. If there is a signal from downstream, the circuit breaker remains closed for the full duration of its tripping delay. If there is no signal from downstream, the circuit breaker opens immediately, regardless of the tripping-delay setting.

Zone selective interlocking can be implemented between all types of MasterPacT MTZ circuit breakers.

When ZSI connects MasterPacT MTZ circuit breakers with circuit breakers other than MasterPacT MTZ, it may be necessary to use a ZSI Interface Module.



Fault 1

Only circuit breaker A detects the fault. Because it receives no signal from downstream, it trips with no intentional delay, regardless of its tripping delay set to 0.3.

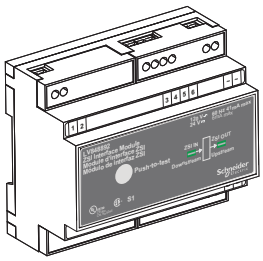
Fault 2

Circuit breakers A and B detect the fault. Circuit breaker A receives a restraint signal from B and remains closed for the full duration of its tripping delay set to 0.3. Circuit breaker B does not receive a signal from downstream and opens immediately, in spite of its tripping delay set to 0.2.

Limits to Device Interconnection:

- A maximum of 15 upstreams devices may be connected to the ZSI input (Z1-Z2).
- A maximum of 15 downstream devices may be connected to the ZSI input (Z3-Z4). If additional units are needed, a ZSI Interface Module is required.

ZSI Interface Module (ANSI 78)



The ZSI Interface Module in a ZSI system with MasterPacT MTZ circuit breakers equipped with MicroLogic X control units:

- Boosts the voltage level of the restraint signal.
- Converts the restraint signal to be compatible with other types of Schneider Electric™ circuit breakers (MasterPacT NT/NW) and Square D™ circuit breakers.
- Provides double insulation to meet requirements of IEC standards when upstream and downstream are different generations of devices (MasterPacT MTZ, MasterPacT NT/NW).

Within a ZSI system, the voltage level of the restraint signal must be maintained at a certain level in order to activate the time delay of electronic trip devices.

If the restraint signal is too weak to activate the time delay feature, all devices that sense the fault will trip with no intentional delay.

The voltage level of the restraint signal can be ineffective due to:

- Restraint wire length exceeding 300 m (984 ft.).

  If restraint wire length exceeds 300 m (984 ft.), the voltage drop along the control wire will weaken the restraint signal until it can no longer activate the time delay on the upstream device. If wire length exceeds 300 m (984 ft.), a ZSI module must be placed in the circuit to boost the voltage level of the restraint signal.
- One device sending a restraint signal to many devices.

  In addition, if the number of upstream circuit breakers exceeds 15, then a ZSI module is required.
- Varying signal levels from different electronic trip systems.

For further details on allowable ZSI combinations, please refer to the ZSI interface module installation bulletin NHA12883.

Characteristics

- Maximum rated operational voltage (V): 690 Vac, 50/60 Hz.
- Power supply: 24 Vdc +25/-20% , 6 mA.
- Maximum operating temperature surrounding the module when installed inside electrical equipment: -35°C to 75°C (-31°F to 167°F).
- Standards compliance: IEC 60950-1, CISPR 22, CISPR 24, UL 489, UL 489SE.
- CE marked according to LVD (Low Voltage Directive 2014/35/EU) EN 60950-1 and EMC directive (2014/30/EU) EN55022, EN55024

Connection & Installation

- Terminal strips, jumpers and 35 mm DIN mounting rail (IEC/EN 60715).
- Twisted wire with a braided shield, 300 Vac, 2.5–0.4 mm^2 (22 AWG).

Instantaneous Override Protection and Close and Latch Ratings

The instantaneous override and close and latch are fixed trip settings to protect the circuit breaker when there is a high fault condition. These settings are typically higher than the standard instantaneous setting and function without regard to any other protection settings.

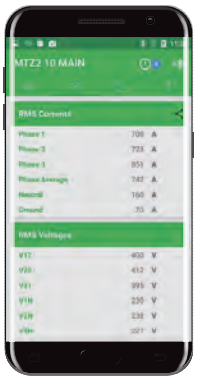
Instantaneous override is a fixed trip setting to open the circuit breaker, under 25 ms, in the event of fault which exceeds the instantaneous override trip value.

The close and latch rating is a fixed trip setting set lower than instantaneous override, to protect the circuit breaker in the event of closing the circuit breaker on an existing fault condition. After 20 ms the circuit breakers reverts to the "instantaneous override" setting.

MicroLogic X Control Unit Measurements

A MasterPacT MTZ device with embedded current sensors and MicroLogic X control unit is a power metering device complying with IEC/EN 61557-12, Class 0.5 accuracy for voltage and current and Class 1 accuracy for active power and energy measurements. For each measurement the accuracy is certified within a temperature range of -25 to 70°C (-13 to 158°F).

Measurements and Electrical Parameters Calculated by the Control Unit

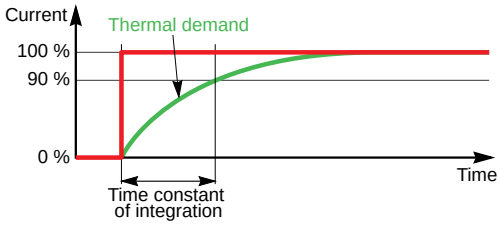


Based on the measurement of line currents, neutral current, phase-to-phase voltages and phase-to-neutral voltages, a MicroLogic X control unit calculates[20] and displays parameters required to monitor any AC electrical power system:

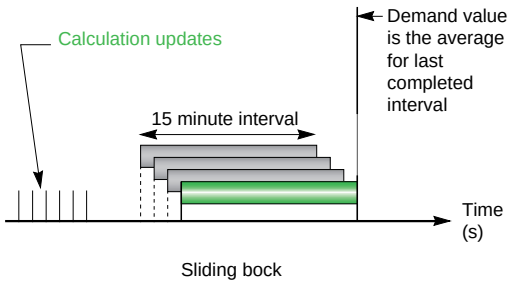
- RMS values of current and voltage
- Active, reactive and apparent power
- Active, reactive and apparent energy
- Power factor
- Frequency
- Phase sequence
- Voltage unbalance, current unbalance
- Current demand
- Total active, reactive and apparent power demand
- THD of voltage and current

The calculation of current and power demand are performed in compliance with IEC/EN 61557-12.

Thermal Demand



Demand Calculated with a Sliding Block Interval



Electrical values calculated by MicroLogic X control units can be shown on the embedded HMI display, a smart device via Bluetooth, embedded web pages of Ethernet gateways, a PC running EcoStruxure Power Commission Software and on the FDM128 display unit. They are refreshed every 2 seconds. The display on the

20. Calculations are according to IEC 61557-12, Equipment for testing, measuring or monitoring of protective measures - Part 12: Performance measuring and monitoring devices (PMD).

embedded HMI allows easy navigation through the electrical values and access to a Quickview option for the main basic values.

MicroLogic X control units log and time stamp minimum and maximum values since the last reset of all relevant measurements: currents, voltages, frequency, active power, reactive power, apparent power, total current harmonic distortion (THDI), total voltage harmonic distortion (THDV).... For the complete list of measurements and min / max values, see the MicroLogic X User Guide (DOCA0102EN). The maximum and minimum values are resettable from the embedded display, a smart device via Bluetooth technology or a PC running EcoStruxure Power Commission Software.

An optional external 24 Vdc power supply or the optional VPS module is required to process and display measurements below 20% of the rated current .

The phase-to-neutral voltages are available for four-pole and three-pole circuit breakers providing the connection of the VN terminal of MicroLogic X control units to the neutral. For accuracy of the active power measurement the connection of the VN terminal of MicroLogic X control units to the neutral is necessary. Please refer to the user guide (DOCA0102EN) for more details concerning the wiring and configuration of MicroLogic X control units.

Energy Management Functions of MicroLogic X Control Unit

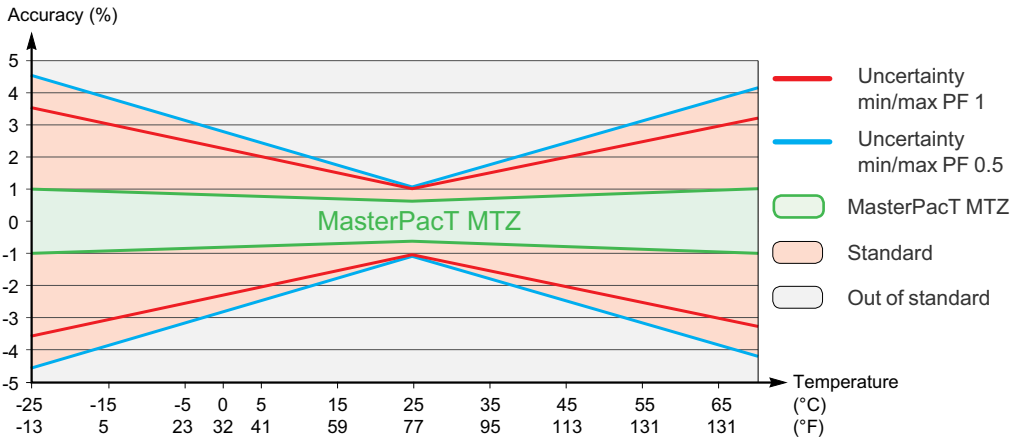
Embedded sensors

A MasterPacT MTZ device equipped with a MicroLogic X control unit and its own embedded sensors is a Class 1 full chain measurement device for active power and energy metering[21].

Embedded power metering avoids variation and uncertainty due to external sensors and wiring.

Effect of Temperature on MasterPacT MTZ Circuit Breaker Measurement

The effect of the temperature on accuracy of the measurement has been carefully managed to maintain an operating temperature between -25°C and 70°C (-13°F and 158°F).



21. According to **IEC/EN 61557-12**. This standard specifies requirements for combined performance of measuring and monitoring devices that measure and monitor the electrical parameters in electrical distribution systems.

MicroLogic X Control Unit Measurement Values

Type of Measurement	Symbol	Accu-racy	Range Min Acc	Range Max Acc	Unit	EHMI [22]	FDM 128	EcoStruxure Power Commission Software, EIFE, IFE, IFM
Currents								
RMS Current of Phases	I1, I2, I3, Iavg	±0.5%	40 [23]	4,000 x 1.2 [23]	A	◉	◉	◉
RMS Current of Phases	I1, I2, I3, Iavg	±0.5%	40 [23]	4,000 x 1.2 [23]	A	◉	◉	◉
Voltages								
RMS Phase-to-Phase Voltage	V12, V23, V31, VLL average	±0.5%	208	690 x 1.2	V	◉	◉	◉
RMS Phase-to-Neutral Voltage	V1N, V2N, V3N, VLN average[24]	±0.5%	120	400 x 1.2	V	◉	◉	◉
Power and Energy								
Active Power	P1, P2, P3, Ptot	±1 %	5	10,000	(±) kW	◉	◉	◉
Reactive Power	Q1, Q2, Q3, Qtot	±2%	5	10,000	(±) kVAR	◉	◉	◉
Apparent Power	S1, S2, S3, Stot	±1%	5	10,000	kVA	◉	◉	◉
Power Factor	PF	±0.02	-1	1		—	◉	◉
Power Factor / Phase	PF1, PF2, PF3	±0.02	-1	1		◉	◉	◉
Fundamental Power Factor (cos φ or DPF)	Cos φ	±0.02	-1	1		—	◉	◉
Fundamental Power Factor (cos φ or DPF) / Phase	Cos φ1, Cos φ2, Cos φ3	±0.02	-1	1		◉	◉	◉
Active Energy [25]	Ep IN / OUT / total [26]	±1%	0	10,000,000	kWh	◉	◉	◉
Reactive Energy[25]	Eq IN / OUT / total [26]	±2%	0	10,000,000	kVARh	◉	◉	◉
Apparent Energy [25]	Es IN / OUT / total [26]	±1%	0	10,000,000	kVAh	◉	◉	◉
Active Energy [27]	Ep IN / OUT / total [26]	±1%	0	10,000,000	kWh	—	◉	◉
Reactive Energy [27]	Eq IN / OUT / total [26]	±2%	0	10,000,000	kVARh	—	◉	◉
Apparent Energy [27]	Es IN / OUT / total [26]	±1%	0	10,000,000	kVAh	—	◉	◉
Current and Power Demands								
Current demands	I1, I2, I3, IN, Iavg	±0.5%	40 [28]	4,000 x 1.2 [28]	A	—	◉	◉

22. Embedded HMI of the control unit.
23. 40–1600 A x 1.2 for MTZ1, 40–4000 A x 1.2 for MTZ2, 80–6300 A x 1.2 for MTZ3.
24. Phase to neutral voltage available only with 4 pole circuit breakers or 3 pole circuit breakers with VN terminal connected to Neutral.
25. With reset.
26. IN+OUT or IN-OUT according to setting.
27. Without reset.
28. 40 to 1600 A x1.2 for MTZ1, 40 to 4000 A x1.2 for MTZ2, 80 to 6300 A x1.2 for MTZ3.

Type of Measurement	Symbol	Accu-racy	Range Min Acc	Range Max Acc	Unit	EHMI [29]	FDM 128	EcoStruxure Power Commission Software, EIFE, IFE, IFM
Total active power demand	Ptot	±1%	5	10,000	(±) kW	—	◉	◉
Total reactive power demand	Qtot	±2%	5	10,000	(±) kVAR	—	◉	◉
Total apparent power demand	Stot	±1%	5	10,000	kVA	—	◉	◉
Power Quality								
Frequency	F	±0.005	40	70	Hz	◉	◉	◉
Phase Sequence (0: a,b,c /1,2,3 - 1: a,c,b /1,3,2)	Phase sequence	NA	1 2 3	1 3 2	0 - 1	◉	◉	◉
RMS Current on Neutral	IN [30]	±1%	40 [31]	4,000 [31]	A	◉	◉	◉
RMS Current on Ground Current	Ig	±5%	40 [31]	4,000 [31]	A	◉	◉	◉
THDI Current Phase	ITHD I1, I2, I3, Iavg	Cl 5 [32]	0 %	100 % [33]	% [33]	◉ [34]	◉	◉
THDI I Neutral	ITHD IN [30]	Cl 5 [32]	0%	100% [35]	%[35]	◉ [34]	◉	◉
THDU Phase-to-Phase voltage	VTHD V12,23,31, LLavg	Cl 2 [32]	0%	20% [35]	%[35]	◉ [36]	◉	◉
THDV Phase-N Voltages	VTHD V1N,2N,3N, LNavg [37]	Cl 2 [32]	0%	20% [35]	%[35]	◉ [36]	◉	◉
Current Unbalance vs Average 3 Phase RMS Currents	I_unbal 1,2,3, Iunbal (worst)	+5%	0%	100%	%	◉	◉	◉
Phase-to-Phase Voltage Unbalance	VLL_Unbal 12 23 31 unbal	Cl 0.5	0%	10%	%	◉	◉	◉
Phase-to-Neutral Voltage Unbalance	VLN_Unbal 1N, 2N 3N, unbal[38]	Cl 0.5	0%	10%	%	◉	◉	◉

NOTE: MicroLogic X control units log and time stamp minimum and maximum values since last reset of all relevant measurements. Main maximum values may be read on embedded HMI (Currents, Voltages, Frequence, Ptotal, Qtotal, THDIavg, THDUavg,THDIN ...). For a complete list of measurements and min / max values, see the MicroLogic X User Guide DOCA0102EN.

29. Embedded HMI of the control unit.
30. Neutral current available only with 4 pole circuit breakers or 3 pole circuit breakers with External Neutral Current Transformer (ENCT).
31. 40 to 1600 A x1.2 for MTZ1, 40 to 4000 A x1.2 for MTZ2, 80 to 6300 A x1.2 for MTZ3.
32. According IEC/EN 61557-12.
33. THD is calculated refering to fundamental or RMS value.
34. Detail per phase is not displayed on embedded HMI.
35. THD is calculated referring to fundamental or RMS value.
36. Detail per phase is not displayed on eHMI.
37. Phase to neutral voltage available only with 4 pole circuit breakers or 3 pole circuit breakers with VN terminal connected to Neutral.
38. Phase to neutral voltage available only with 4 pole circuit breakers or 3 pole with VN terminal connected to Neutral.

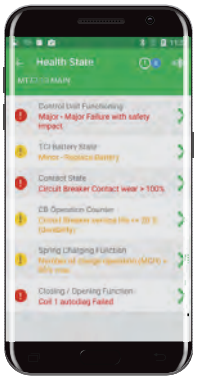
MicroLogic X Control Unit Diagnostics and Maintenance

The MicroLogic X control unit performs a high level of diagnostics in real time on MasterPacT MTZ circuit breakers. They generate and store appropriate warnings, alarms, and messages to help the users with maintenance and power restoration.

These diagnostics:

- Prevent interruption of the power supply to maintain continuity of operation, preserve assets from damage, and support the safety of personnel.
- Reduce downtime resulting from an unexpected outage in the electrical distribution system by facilitating a restart as quickly as possible after a trip.
- Keep devices in good operating condition and aid qualified personnel when repairs are required.
- Build the history and traceability of all interventions to improve preventive maintenance and secure daily operation.

Prevention of Power Supply Interruptions

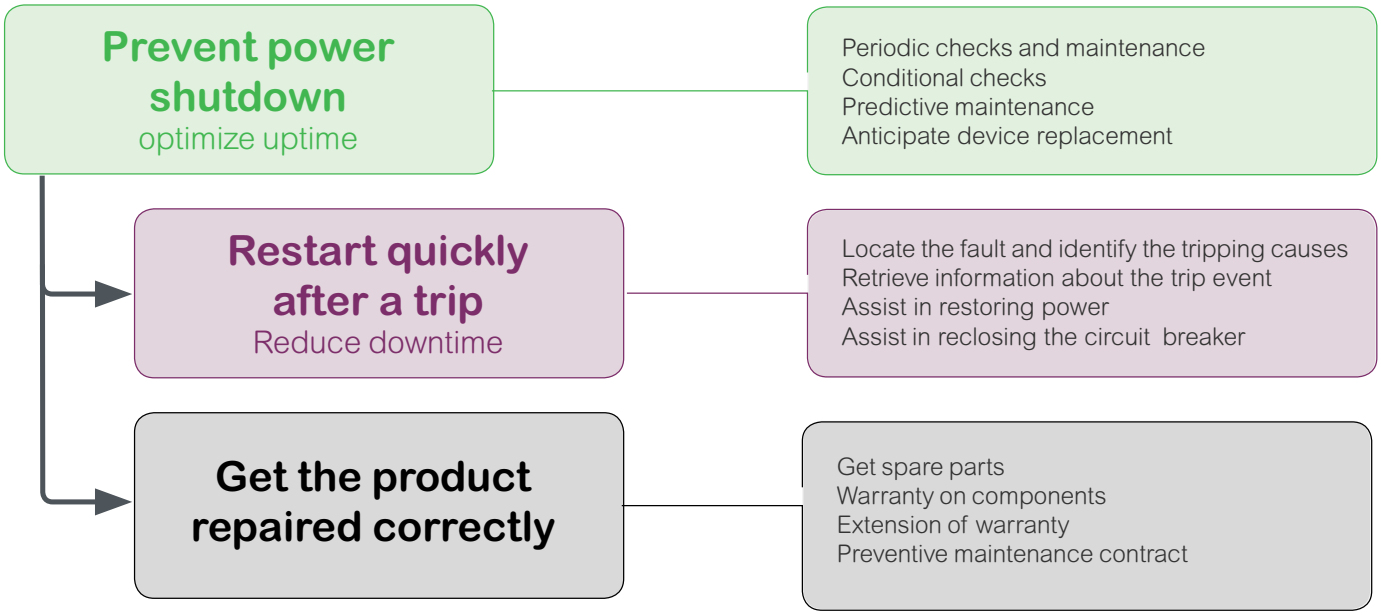


The MicroLogic X control unit monitors the condition of the circuit breaker and generates information to help in scheduling periodic checks and, if needed, replacement of devices.

Most of the active mechanical and electrical components of the circuit breaker and the control unit are monitored. Warnings and alarms are issued when issues requiring the intervention of the maintenance staff are detected.

Maintenance recommendations are based on monitoring the operation and performance of the circuit breaker (such as number of operations, closing, and opening times). When threshold limits are reached or exceeded, alarms and warnings are issued to advise operators to plan maintenance.

The MicroLogic X control unit monitors parameters to estimate circuit breaker aging (load profile, contact wear, and the end of life indicator for instance). Based on the these values, algorithms identify if maintenance or part replacement is needed.



NOTE: for further details please refer to Power Shutdown Prevention and Repair, page 36 and MasterPacT MTZ Services, page 180.

Restart After a Trip

The LEDs on the front of the MicroLogic X control unit identify the tripping cause. Relevant information characterizing the fault can be retrieved using a smart phone or device via either Bluetooth technology or NFC or using EcoStruxure Power Commission Software on a PC.

Warning and Alarm Displays

The MicroLogic X control unit has a "Service" LED to indicate the circuit breaker condition. This LED, represented by a "wrench / spanner", has three states:

- Unlit LED: the unit is in good working order.
- Orange LED: non-urgent intervention is required (contact wear above 60% for example).
- Red LED: alert message that requires immediate intervention (such as contact wear above 100% or an invalid control unit self test).

The messages processed by the MicroLogic X control unit to monitor circuit breaker availability and maintenance operations are classified in three categories:

- Maintenance assistance
- Circuit breaker condition
- Circuit breaker diagnostics

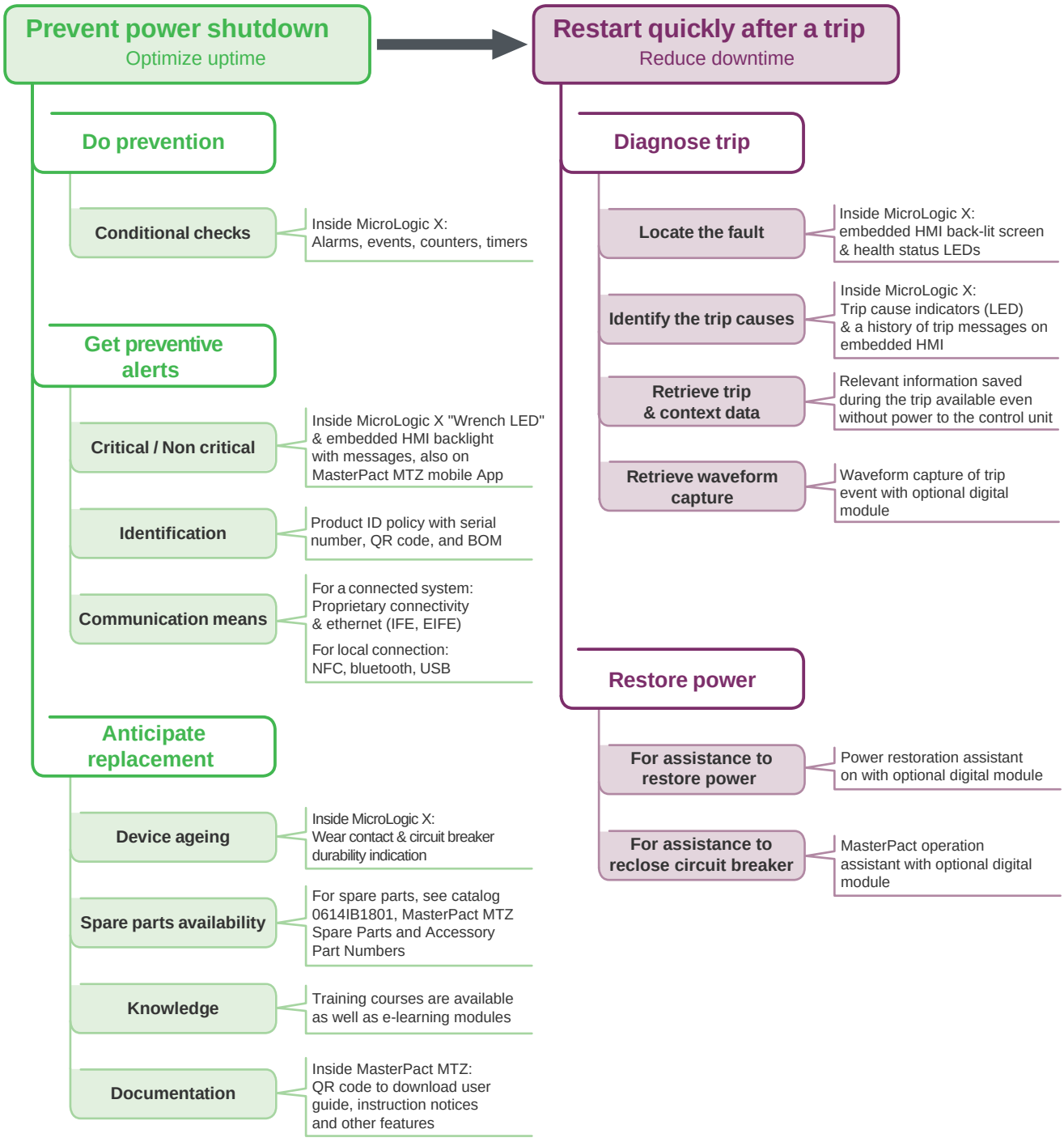
The associated warnings and alarms are displayed on the embedded HMI. The warnings are displayed with an orange backlight, the alarm with a red backlight.

When the MicroLogic X control unit is not energized only the trip alarms with their associated messages remain accessible with a smart phone through NFC.

The various possibilities to display warnings, alarms and messages concerning the management of maintenance and the condition of the circuit breaker are summarized in the following table:

	Trip Unit Energized						Trip Unit Not Energized
	Display on embedded HMI Warning	Display on embedded HMI Alarm	Display on smart phone with Bluetooth technology	EcoStruxure Power Commission Software USB connection	Display On FDM128	IFE/EIFE web pages	Display trip alarm on smartphone with NFC
Warnings	**Orange Backlight**	—	◉	◉	◉	◉	—
Alarms	—	**Red Backlight**	◉	◉	◉	◉	◉

Power Shutdown Prevention and Repair



NOTE: Refer toPrevent Power Shutdown with Conditional Checks, page 37 for details on conditional checks.

Prevent Power Shutdown with Conditional Checks

Monitored Functions and Logs for Circuit Breaker Operation

Elect. Closing Function	Elect. Opening Function	Tripping Function
• XF coil circuit continuity • MCH charging time • “Time stamped” closing log • MCH counter • Alarm fail closing order	• MX coil circuit continuity • MN coil circuit continuity • Opening counter • “Time stamped” opening log (Electrical/ mechanical) • Alarm fail opening order	• Tripping chain continuity (Ready LED) • Trip counter (SDE) • Time stamped event log

Monitored Functions & Logs Fault Detection on MicroLogic X

External Sensors Disconnection	MicroLogic X Control Unit Problem	External Communication Problem
• Internal Current Transformers [T] • External Neutral CT • Vigi Sensor	• ASIC over temp [T] • ASIC problem [T] • Error reading perform / Sensor rating • Internal battery • Trip solenoid is not connected, default is to trip the circuit breaker	• Bluetooth error • Ethernet Error communication (IFE) • IO module

Repairing a Device

The MicroLogic X control unit includes dedicated functions for maintenance assistance.

The following information can be retrieved:

- Serial number and features of the circuit breaker.
- Optional accessories installed on the circuit breaker.
- References for spare parts and replacement accessories.
- Type of problem encountered with maintenance assistance information.

MicroLogic X Control Unit Event Management

Event History	Number of Events
Trip	50
Protection	100
Diagnostic	300
Metering	300
Configuration	100
Operation	300
Communication	100

A list of predefined events has been selected for user notification of alarms and traceability processed by a MicroLogic X control unit.

These events are classified in seven families: trip, protection, diagnostic, metering, configuration, operation, and communication.

Definition and Categories of Events

MicroLogic X control unit functions produce events available for alarm notification or history logging, in addition to their main action of tripping, measuring, and counting.

All events are time stamped and logged in non-volatile memory so they are maintained if control power is lost.

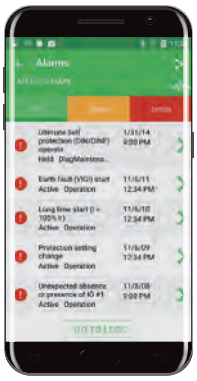
Events have two characteristics:

- Event category: trip, protection, diagnostic, metering, configuration, operation, communication
- Event severity: high-level, medium-level, low-level

Events can be of two types:

- occurrence/completion
- instantaneous/latched/unlatched

Event Logbooks



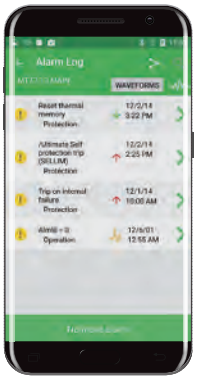
Events are logged according to the event category:

- Trip : long-time trip, short-time trip, trip on invalid control unit self test...
- Protection : setting change, I > 90% Ir long time, change from set A to set B ...
- Diagnostic : voltage release, low battery ...
- Metering : reset min/max, reset energy counters…
- Configuration : digital module license …
- Operation : opening, closing, alarm reset...
- Communication : Bluetooth enabled ...

All events are logged regardless of their severity. Each history can log a predefined number of events. When that number is reached each new event overwrites the oldest event, and other histories are left unchanged (first-in first-out [FIFO]).

For the complete list of events see the MicroLogic X control unit user guide DOCA0102EN.

Event Notification



- High severity events generate pop-ups on embedded HMI with a red backlight.
- Medium severity events generate pop-ups on embedded HMI with an orange backlight.
- On the FDM128 display unit they change the related pictogram color to red for high severity events or orange for medium severity events.
- All events can be signalled individually or by group to a digital output (M2C or IO module).
- All events can trigger an email through EIFE or IFE communication interfaces.
- High and medium severity events can be read on the embedded HMI, a PC or a smart phone.
- All the events logged can be displayed with EcoStruxure Power Commission Software, a smart phone or the FDM128 display. They are shown in chronological order. They can be sorted according to the following selections: date and time, severity, or category.

Event Type and Reset Mode

There are two types of events:

Occurrence / Completion events: These events have a beginning and an end (for example: long-time pick-up and dropout).

Instantaneous events: These events have no duration (for example reception of an opening order, circuit breaker tripping or settings changes).

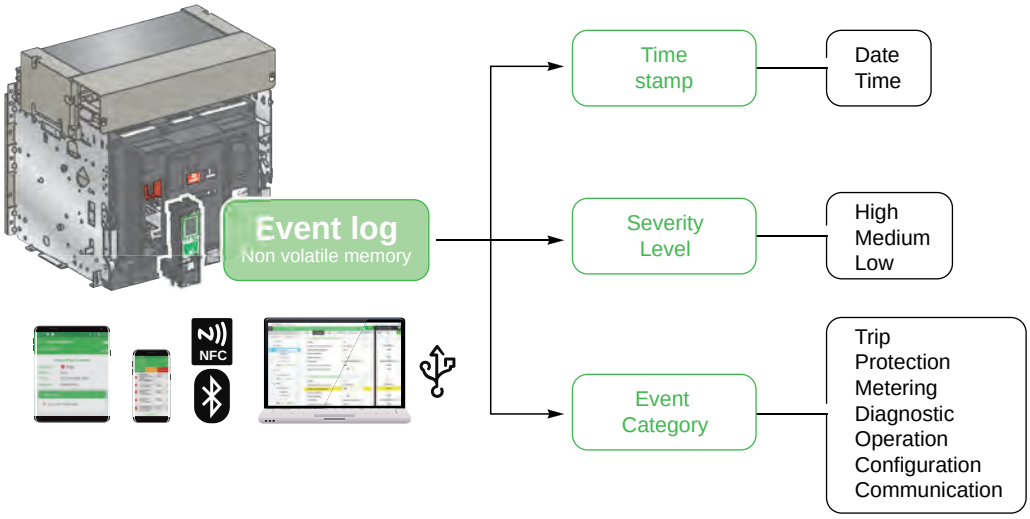
An event may be latched or unlatched:

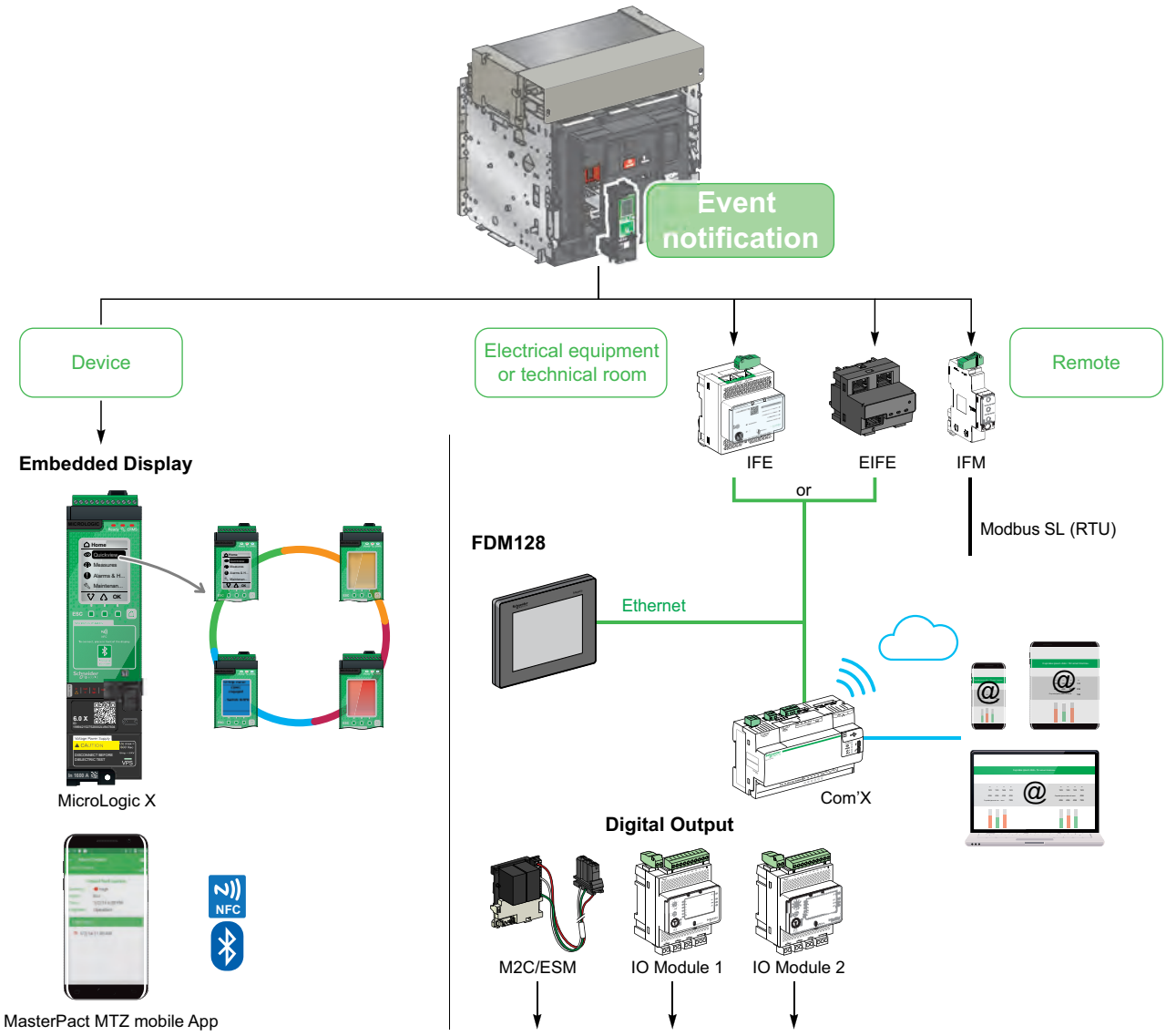
- A latched event does not reset automatically. It remains in hold position after its cause has disappeared or until it is reset by the user.
- An unlatched event is active while its cause is present and returns to inactive as soon as its cause disappears or is resolved.

For latched events a reset action can be made:

- From the test/reset button on the front face of the MicroLogic control unit.
- From a PC.
- From a smart phone.
- Via Ethernet and Modbus SL (RTU) through the EIFE, IFE and IFM interfaces.

Use a PC, a smartphone, Ethernet or Modbus SL (RTU) to reset events managed by the MicroLogic X control unit.


Event log
Non volatile memory
NFC
Time stamp
Date Time
Severity Level
High
Medium
Low
Event Category
Trip
Protection
Metering
Diagnostic
Operation
Configuration
Communication


Event notification
Device
Electrical equipment or technical room
Remote
Embedded Display
MicroLogic X
MasterPact MTZ mobile App
NFC
IFE
EIFE
IFM
or
Modbus SL (RTU)
FDM128
Ethernet
Com'X
Digital Output
M2C/ESM
IO Module 1
IO Module 2

MicroLogic X Control Unit Power Supply

The MicroLogic X control unit is powered by the current through the internal current transformers (CT).

The standard protection functions of MicroLogic X control units operate with the internal current supply.

Internal Power Supplies

If the load current is higher than 20% of the rated current In, the internal current supply provides the power supply for the full functioning of the MicroLogic X control unit. This includes:

- The MicroLogic X HMI, display screen, and LEDs.
- The metering functions with accuracies in accordance with IEC 61557-12.
- The maintenance and diagnostic functions.
- Communication through ULP modules.
- Communication through Bluetooth low energy technology.

External Power Supplies

To provide a power supply to the MicroLogic X control unit when the load is below 20% of the rated current In, and maintain the full functioning of the MicroLogic X control unit, optional power supplies can be used. Optional power supplies include the following:

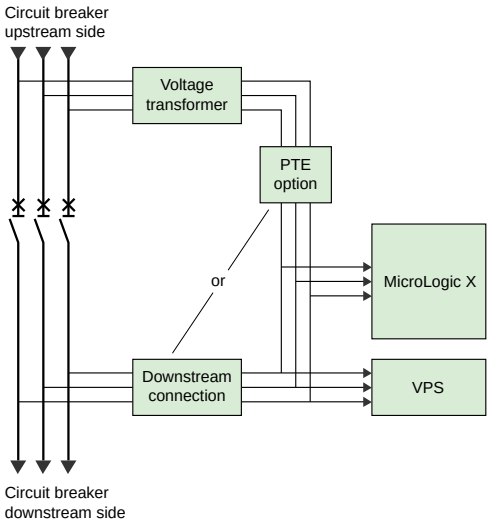
- Permanent power supplies:
  - Internal voltage power supply (VPS) module, up to 600 Vac.
  - External 24 Vdc power supply.
- Temporary power supplies connected to the mini USB port of the MicroLogic X control unit:
  - External Mobile Power Pack through USB connection.
  - Android smartphone through USB OTG connection (smartphone must be compatible with USB OTG - see list of compatible smartphones available on the Schneider Electric website).
  - PC through USB connection.

MicroLogic X control units are also equipped with an internal battery dedicated to the supply of the LED indicators and the internal clock. It allows the user to read and identify the trip cause when the circuit breaker trips. The battery is a lithium type with a service life of approximately ten years. The battery condition can be checked by pressing the test button on the front of the MicroLogic X control unit.

An external 24 Vdc power supply is required when IFE/EIFE/IFM communication modules, IO modules or an FDM128 display unit are installed.

The XF diag&com, MX diag&com, MN diag, XF, MX, and MN voltage release coils and the spring charging motor MCH require a power supply separate from the MicroLogic X control unit power supply.

MicroLogic X Control Unit Voltage Measurement Inputs



The input voltage of the VPS module is limited to 600 Vac. The module is directly connected to the internal pickup voltage (PTI) on the downstream side of the circuit breaker. The VPS module can be supplied from an external voltage by means of the optional PTE voltage measurement inputs and voltage transformers (mandatory for voltages above 600 Vac).

The external voltage can be picked up either from the top or the bottom side of the circuit breaker.

When the power source and the PTE option are connected on the same side of the circuit breaker (for example, both the power source and the PTE are connected on the top side), the MicroLogic X control unit is energized as soon as the power source is live, whatever the position of the circuit breaker (open or closed).

When the power source and the PTE option are connected on different sides of the circuit breaker (for example, the power source is connected on the top side and the PTE on the bottom side), the MicroLogic X control unit is energized only when the circuit breaker is closed.

The possible VT ratio are the following:

- Primary range:
  - Min value: 100 V
  - Max value: 1250 V
- Secondary range:
  - Min value: 100 V
  - Max value: 690 V
  - Recommended values: 220-400 V
- Power ≥ 10 VA
- Max voltage for VPS is 600 V (see Voltage Power Supply Module (VPS), page 112)

Recommended Alternative Power Sources

Recommended Alternative Power Sources in Different Situations					
Situation	**Purpose**	**VPS**	**External 24 Vdc Power Supply**	**PC Supply**	**Portable Battery**
Circuit breaker is energized and current is < 20% of rated current.	Maintains protection functions, measurement data, communication, diagnostic data, HMI, and wireless features.	◉	◉	—	—
Circuit breaker is opened or not energized.	Retrieve information from control unit front screen/ embedded HMI or with Bluetooth connection.	—	◉	◉	◉
During setting, commissioning, testing and maintenance.	Complete any testing or evaluation of the breaker function or control devices.	—	◉	◉	◉
When IFE/EIFE, IO module or FDM128 is installed.	These devices require a power supply.	—	◉	—	—

NOTE: For more information about the VPS module, the external 24 Vdc supply, and the portable battery, please refer to MasterPacT MTZ Power Supply Accessories, page 107.

	MicroLogic X		**EIFE**	**IFE**	**IO Module**	**FDM128**
	Without M2C	**With M2C**				
Power consumption (mA) 24 Vdc	250	300	250	150	150	283

Digital Modules for MicroLogic X Control Units

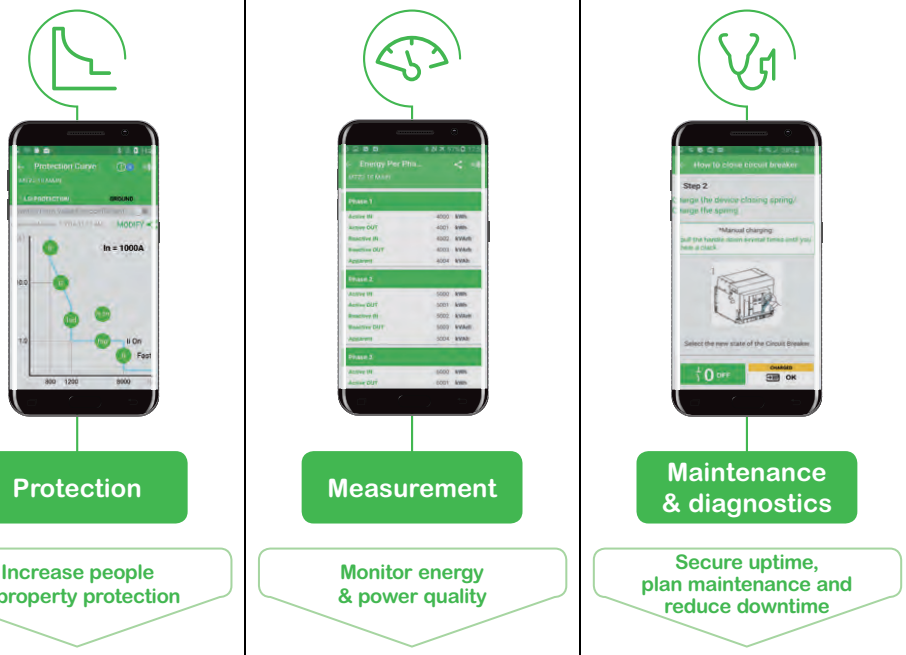
Overview of MicroLogic X Digital Modules

> Go to GoDigital

Optional digital modules can be purchased on the GoDigital website to digitally customize MicroLogic X control units that have already been installed in MasterPacT MTZ circuit breakers. The digital modules are dedicated to optional protection, measurement, and maintenance & diagnostics functions.

The MicroLogic X control unit is part of the original order, and may be updated during commissioning or after the equipment is energized and operational. This is done with a platform called GoDigital that allows users to purchase and download digital modules.

The control unit firmware may also be upgraded to ensure compatibility with the latest digital modules and ensure system will operate properly. This is done with Ecoreach software that is connected to the device by USB connection or through the communication system.



Optional Protections > ANSI 27/59—Under/Over Voltage Protection, page 53 ANSI 81—Under/Overfrequency Protection, page 54 > ANSI 32P—Reverse Active Power Protection, page 56 > ANSI 51—IDMTL Overcurrent Protection, page 57 > ANSI 67—Directional Overcurrent, page 58 > ANSI 51N/51G—Ground-Fault Alarm, page 60 > ERMS—Energy Reducing Maintenance Settings, page 61	**Cost Management** > Energy per Phase Digital Module, page 45 **Power Quality** > Individual Harmonics Analysis, page 46	**Power Outage** > Power Restoration Assistant, page 47 > MasterPacT Operation Assistant, page 48 > Waveform Capture on Trip Event, page 49 **Communication** > Modbus Legacy Dataset, page 50 > IEC 61850 for MasterPacT MTZ, page 51

MicroLogic X Optional Measurement Modules

Energy per Phase Digital Module

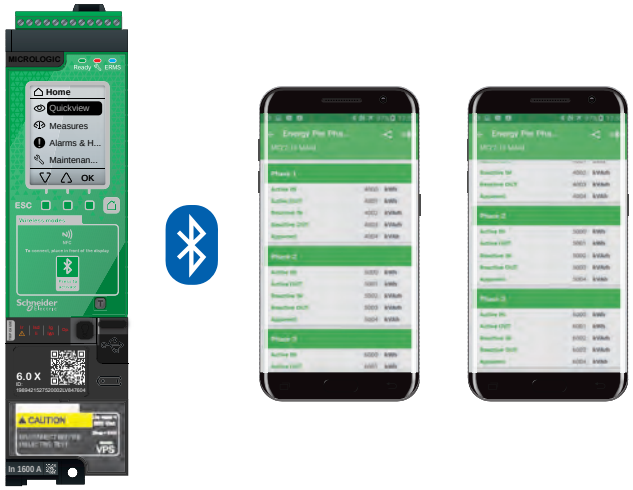
This Energy per Phase digital module calculates and displays the active, reactive and apparent energy per phase of the power system network at the point of measurement.

It also provides the total active, reactive and apparent energy per phase.[39]

Benefits

Monitors energy per phase when there are unbalanced loads in low voltage installations, or when different usages or tenants are supplied on each phase.

> **NOTE:** Energy per phase digital modules can be installed on a four-pole or three-pole MasterPacT MTZ circuit breaker with the neutral connected to the Vn terminal of the MicroLogic X control unit and the ENVT = Y configuration.



Energy per Phase Digital Module							
Type of Measurement	Symbol	Accuracy	Range min acc	Range max acc	Unit	Embedded HMI, Ecoreach Software	Ecoreach Software, Smartphone EIFE IFE, IFM
Active energy IN per phase	Ep IN, phase 1/2/3	± 1%	0	10,000,000	kWh	—	◉
Active energy OUT per phase	Ep OUT, phase 1/2/3	± 1%	0	10,000,000	kWh	—	◉
Total active energy per phase [40]	Ep phase 1/2/3	± 1%	0	10,000,000	kWh	—	◉
Reactive energy IN per phase	Eq IN, phase 1/2/3	± 2%	0	10,000,000	kVARh	—	◉
Reactive energy OUT per phase	Eq OUT, phase 1/2/3	± 2%	0	10,000,000	kVARh	—	◉
Total reactive energy per phase[40]	Eq phase 1/2/3	± 1%	0	10,000,000	kVARh	—	◉
Total apparent energy per phase	Es phase 1/2/3	± 1%	0	10,000,000	kVAh	—	◉

39. This module can be installed on a 4-pole MasterPacT MTZ device or a 3-pole with the neutral connected to the VN terminal and ENVT; for 3P4W, wye configurations.
40. IN+OUT or IN-OUT according to setting.

Individual Harmonics Analysis

Individual Harmonics Analysis digital modules provide harmonics of voltage and current to the 40th harmonic. Individual harmonics are calculated every 200 ms[41]. The average values of the individual harmonics are calculated over a time period of 3 s.

The instantaneous effects of harmonics include:

- Disturbance of the operation of power electronics equipment.
- Generation of pulsating mechanical torques, vibrations, and noise in asynchronous motors.
- Additional measurement errors in metering devices.
- Interference on communication and control circuits.

The long-term effects include:

- Additional losses and heating in power transformers, rotating machines, capacitors, and power cables.
- Mechanical fatigue and premature aging of motors.
- Degradation of the performance of electrical installations.
- Degradation in the energy efficiency due to increased losses.
- Premature aging and oversizing of the electrical equipment.

The total voltage harmonic distortion (THDV) limits are[42]:

- THDV < 5%: Insignificant deformation of the voltage waveform: No significant risk to equipment.
- 5% < THDV < 8%: Significant deformation of the voltage waveform: Risk of over-heating and equipment problems.
- THDV > 8%: Major deformation of the voltage waveform. High risk to equipment if installation has not been specifically sized for the distortion.

Benefits

Individual harmonics are displayed on a smart device and can be shared by text or e-mail for remote data analysis by off-site experts, such as Schneider Electric Services.

Real-time monitoring of harmonic pollution enables appropriate decisions to be made when unacceptable levels are reached:

- Deeper investigation, based on measurements and recordings.
- Dedicated studies.
- Installation of passive filters.
- Installation of active filters.

Individual Harmonics Analysis Digital Module							
Harmonic Measurement	**Symbol**	**Accuracy**	**Range min acc**	**Range max acc**	**Unit**	**Embedded HMI, IFM, FDM128, Ecoreach**	**Smart-phone, EIFE, IFE**
Currents up to rank 40	I1, I2, I3, IN	Cl II [43]	40 [44]	4000 x 1.2[44]	A	—	◉
Phase-to-phase voltage up to rank 40	V12, V23, V31	Cl II [43]	208	690 x 1.2	V	—	◉
Phase-to-neutral voltage up to rank 40	V1N, V2N, V3N	Cl II [43]	120	400 x 1.2	V	—	◉

41. Values are calculated as specified in IEC 61000–4–30 (Testing and measurement techniques - Power quality measurement methods).
42. These values are taken into account by EMC standard IEC 61000-2-4.
43. According to IEC/EN 61000-4-7.
44. 40–1600 A x1.2 for MTZ1, 40–4000 A x1.2 for MTZ2, 80–6300 A x1.2 for MTZ3.

MicroLogic X Optional Maintenance & Diagnostic Modules

Power Restoration Assistant

The Power Restoration Assistant digital module displays available events and circuit breaker information. This helps the operator determine potential causes of the event such as: opening, manual or electrical trip or loss of power. It also provides guidance for potential solutions to restore power.

NOTE: If utilizing electrical accessories (MX, MN, XF), this module can be optimized by using the diagnostic and communicating version of the accessories.

Benefit

This module helps reduce circuit breaker downtime after the circuit breaker trips, opens, or there is a loss of upstream power supply by providing guidance based on all collected information to assist in power restoration efforts.

MasterPacT Operation Assistant

The MasterPacT Operation Assistant digital module assists in closing or opening the circuit breaker remotely with Bluetooth by delivering applicable instructions such as reset circuit breaker or charge the mechanism. It displays circuit breaker status such as: Ready to close, coil status or spring status.

The full benefit of this function is given with the diagnostic and communication shunt trip, undervoltage release, and shunt close (MX, MN, and XF diag&com).

NOTE: Diagnostic and electrical accessories (MX, XF) are required for the remote functionality of this module.

Benefits

This module allows smart device closing and opening of the circuit breaker, from a safe distance, outside of the arc flash zone. It may reduce the need for Personal Protective Equipment (PPE) level during opening/closing of the circuit breaker.

Reclosing MasterPacT MTZ1, MTZ2, and MTZ3 Circuit Breakers from a Distance

Waveform Capture on Trip Event

The Waveform Capture on Trip Event digital module automatically logs five cycles of phase and neutral currents, with a sampling period of 512 microseconds, which is valuable data for diagnosing a trip event. The record can be retrieved with a smartphone or through Ecoreach software (Comtrade format). In addition, the waveform capture function records the circuit breaker status (open/close/trip) and the ZSI out signal. The five cycles of the waveform capture include one cycle before the trip event and four cycles after.

Benefits

Use the automated recording of the waveform image to help analyze a trip event in detail. At a glance, the nature of the trip event can be viewed and understood, displaying the severity of the trip event (with amplitude and duration) and can help identify the potential damage to a facility. Digital signals, like fault-trip indication contact (SDE) / Open / Zone Selective Interlocking (ZSI) support the analysis of the circuit breaker behavior in the power system (i.e. response time, selectivity). Throughout the trip event recording, scrolling in or out adjusts the time period being viewed.

Waveform Capture with MasterPacT MTZ Circuit Breakers

Modbus Legacy Dataset

The Modbus Legacy Dataset is compatible with the dataset format of the MicroLogic control unit of MasterPacT NT/NW devices.

MasterPacT MTZ circuit breakers provide standard format Modbus registers.

Supervision software for MasterPacT NT/NW circuit breakers uses Modbus drivers that are compatible with legacy format Modbus registers.

This dataset can be used by existing Modbus drivers running supervision software designed for MasterPacT NT/NW and MasterPacT MTZ circuit breakers avoiding any modification in the supervision software.

The Modbus dataset collects information for remote supervision software in one convenient Modbus table (starting at register 12000 for the legacy dataset, starting at register 32000 for the standard dataset). This table contains the following information:

- Circuit breaker status
- Tripping causes
- Real time values (current, voltage, power, energy…)

The user can get the information contained in this table with only two read requests.

Firmware Modbus Legacy Dataset Can Be Used With

Firmware	Part Number	Version
EIFE firmware	LV851100SP	≥ V004.000.xxx
IFE standalone firmware	LV434010	≥ V003.007.xxx
	LV434001	≥ V004.000.xxx
IFE gateway firmware	LV434011	≥ V003.007.xxx
	LV434002	≥ V003.007.xxx
IFM firmware	LV434000	All

Benefits

The Modbus legacy dataset digital module activates the legacy Modbus registers in the MTZ circuit breaker and allows the system integrator to use the existing Modbus driver within the supervision software.

It allows easy integration in existing installations where modification of supervision software for MTZ circuit breakers is not desired.

IEC 61850 for MasterPacT MTZ

IEC 61850 is an Ethernet-based protocol designed for electrical substations. It is a standardized method of communications, developed to support integrated systems composed of multi-vendor, self-describing IEDs (Intelligent Electronic Device) that are networked together to perform monitoring, metering, real-time protection and control. IEC 61850 is gaining wide adoption in Critical application such as O&G, data centers. Thanks to the IEC 61850 digital module, Masterpact MTZ natively fits into such systems.

Description

The IEC 61850 for MasterPacT MTZ digital module provides MasterPacT MTZ circuit breaker data over ethernet network in conformance with IEC 61850 MMS communication protocol. The installation of this digital module on MicroLogic X control unit will automatically enable IEC 61850 MMS communication protocol on IFE or EIFE communication interface in addition to existing Modbus TCP/IP protocol.

The MasterPacT MTZ circuit breaker data are:

- class 1 energy metering
- electrical measurements
- status
- control.

Benefits

The IEC 61850 MMS (Manufacturing Message Specification) communication protocol helps integrating Low Voltage circuits breakers in Medium Voltage installation without the need of additional gateway. Communication of Low Voltage circuit breakers data (class 1 energy metering data, electrical measurements, status and control) to IEC 61850 supervision systems (EcoStruxure Substation Operation based on PACiS technology) become smooth and easy. IEC 61850 for MasterPacT digital module supports IEC61850 Edition 2 protocol and provides the following logical nodes:

Logical Node	Description
CSWI	Switch controller. This logical node is used to control circuit breakers and switches
GGIO	Generic process I/O. For information on how to configure the GGIO, refer to your I/O module guide.
LLN0	Logical node zero. Contains the data related to the associated IED.
LPHD	Physical device. Contains information related to the physical device.
MHAI	Harmonics. Consists of harmonic values such as THD, K factor, Crest factor.
MMTR	Metering. Consists of the integrated values (energy), primarily for billing purposes.
MMXU	Measurements. Contains per-phase and total current, voltage and power flow for operational purposes.
MSQI	Sequence. Consists of sequence values for three/multi-phase power systems via symmetrical components
PTOC	Time overcurrent protection
PIOC	Instantaneous Over Current protection
PTOV	Overvoltage protection
PTUV	Undervoltage protection
PDOP	Reverse Power Protection
PTRC	Protection trip conditioning.
XCBR	Circuit Breaker. Indicates the status of the circuit breaker

MicroLogic X Optional Protection Modules

The MicroLogic X control unit can be customized with optional protection at any time, without operation disruption and without additional hardware.

Optional protection modules are available to improve the monitoring and operation of electrical networks:

- Undervoltage
- Overvoltage
- Reverse active power
- Ground-fault alarm

Optional protection is available for all types of MicroLogic X control units. These protections require the MicroLogic X control unit to be supplied by an external 24 Vdc power supply.

Each optional protection has the following protection parameters :

- ON/OFF
  - ON: Protection is enabled.
  - OFF: Protection is disabled.
- Trip/Alarm
  - Trip: tripping order is sent to the tripping voltage release in order to open the circuit breaker.
  - Alarm: no tripping order is sent, alarm only.
- Inhibition disable/Inhibition enable
  - Inhibition disable: optional protection cannot be inhibited.
  - Inhibition enable: optional protection can be inhibited by using an input of the IO module. The inhibition inhibits all the optional protections that have the inhibition setting enabled.

An adjustable time-delay is associated with each protection.

The time-delay starts as soon as the protection picks up.

Each optional protection generates the following events:

- When set in “alarm” mode:
  - Start event when the protection picks up.
  - Operate event when its associated time-delay elapses.
- When set in “trip” mode:
  - Start event when the protection picks up.
  - Operate event when its associated time-delay elapses.
  - Trip order event when the circuit breaker tripping voltage release (trip solenoid) activates.

The start event is generated even if the protection is inhibited. The operate event and the trip order event are generated only when the protection is not inhibited.

Each optional protection can be set as follows:

- From a smartphone via Bluetooth technology.
- From a PC running Ecoreach software.

ANSI 27/59—Under/Over Voltage Protection

The Under/Over Voltage Protection digital module monitors the circuit breaker voltages and trips when the voltage exceeds the settings.

The voltage in electrical installations must be maintained between a minimum value and a maximum value, generally the rated operating voltage ±10%. Beyond these limits the operation and performance of the loads may be impacted. Under/overvoltage protection monitors the system voltage so that if the voltage level of an installation goes out of its acceptable limits, appropriate action can be taken.

Description

This module monitors the voltages V12, V23, V31 or V1N, V2N, V3N, and trips the circuit breaker if the voltage exceeds the settings. For ANSI 27-1 and 59-1 the protection activates when one of the three monitored voltages reaches the designated upper or lower limit. For ANSI 27-2 and 59-2 the protection activates when all the three monitored voltages reaches the designated upper or lower limits.

> **NOTE:** The Under/Over voltage protection requires the MicroLogic X control unit to be supplied by an external 24 Vdc power supply.

For each undervoltage protection, ANSI code 7, and overvoltage protection, ANSI code 59, the user can choose to monitor either the three phase-to-phase voltages V12, V23, V31, or the three phase-to-neutral voltages V1N, V2N, V3N.

The selection applies for both undervoltage and overvoltage protections. It is not possible to select phase-to-phase voltages for undervoltage monitoring and phase-to-neutral voltages for overvoltage monitoring and vice versa. Under and overvoltage protections operate according to a definite time characteristic. One adjustable time-delay is associated to each of the four elements. The time-delay starts as soon as the protection picks up. Each element generates the start, operate and trip events (see MicroLogic X Optional Protection Modules, page 52) . When the undervoltage protection is set in tripping mode, the voltage measurement must be performed on the power source side to allow the circuit breaker closing. Standard installation has the MicroLogic X control unit voltage input directly connected to the internal pickup voltage on the bottom side of the circuit breaker.

Consequently:

- If the circuit breaker is bottom-fed, the internal pickup voltage is suitable for undervoltage protection and circuit breaker closing.
- If the circuit breaker is top-fed, an external voltage input is required. The PTE option must be selected to perform the voltage measurement on the power source side.

The protection trips when:

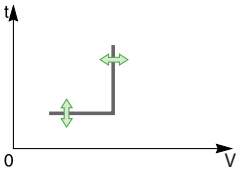
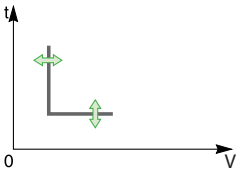
- the value of voltage exceeds the setting.
- the associated timer is elapsed.

Benefits

The information is used to generate alarms and, when required, open the circuit breaker.

The Undervoltage/Overvoltage Protection digital module is suitable for generator protection.

The permanent monitoring of phase-to-phase or phase-to-neutral voltages enables appropriate action to be initiated to safeguard the operation of the installation during abnormal or critical situations, for example: load shedding, source change-over, and emergency generator starting.

MicroLogic 3.0 X, 5.0 X, 6.0 X Under/Overvoltage Protection			
	**Under Voltage**	**ANSI Code 27**	
	27-1 Voltage setting (V) V12,V23,V31 or V1N,V2N,V3N	Accuracy: ±0.5%	20 to 1200 V, by steps of 1 V
	Protection picks up when one of the three monitored voltages reaches the setting		
	Time setting	Max breaking time: 140 ms (with time delay set to 0) Accuracy: ±2%	0 to 300 s, by steps of 0.01s
	27-2 Voltage setting (V) V12,V23,V31 or V1N,V2N,V3N	Accuracy: ±0.5%	20 to 1200 V, by steps of 1 V
	Protection picks up when the three monitored voltages have reached the setting		
	Time setting	Max breaking time: 140 ms (with time delay set to 0) Accuracy: ±2%	0 to 300 s, by steps of 0.01 s
	**Over Voltage**	**ANSI Code 59**	
	59-1 Voltage setting (V) V12,V23,V31 or V1N,V2N,V3N	Accuracy: ±0.5%	20 to 1200 V, by steps of 1 V
	Protection picks up when one of the three monitored voltages reaches the setting		
	Time setting	Max breaking time: 140 ms (with time delay set to 0) Accuracy: ±2%	0 to 300 s, by steps of 0.01 s
	59-2 Voltage setting (V) V12,V23,V31 or V1N,V2N,V3N	Accuracy: ±0.5%	20 to 1200 V, by steps of 1 V
	Protection picks up when the three monitored voltages have reached the setting		
	Time setting	Max breaking time: 140 ms (with time delay set to 0) Accuracy: ±2%	0 to 300 s, by steps of 0.01 s

ANSI 81—Under/Overfrequency Protection

The frequency in electrical installations must be maintained within accepted operating levels to minimize the risk of damage to motor loads, sensitive electronics, and to ensure the proper operation and performance of all loads. Generally, the allowed rated operating range of frequency is ±10 %. The ANSI 81- Under/Over frequency protection digital module allows the frequency to be continuously monitored. If the frequency level of an installation goes out of its acceptable limits, the information delivered by this digital module can be used to initiate appropriate action to restore good operating conditions in the installation.

Description

The ANSI 81 – Under/Over frequency protection digital module is used to generate either an alarm or a trip. There are two independent protections: underfrequency (ANSI 81U) and overfrequency (ANSI 81O). The protection picks up when the frequency reaches its upper or lower limit. Underfrequency and overfrequency protections operate according to a definite time characteristic. One adjustable time-delay is associated to each protection. The time-delay starts as soon as the protection picks up. Each protection generates the start, operate and trip events as described in the table above. When the underfrequency protection is set in trip action, the voltage measurement must be performed on the power source side to allow the circuit breaker closing. As standard, the MicroLogic X voltage input is directly connected to the internal pickup voltage on the bottom side of the circuit breaker.

Details of required power connections:

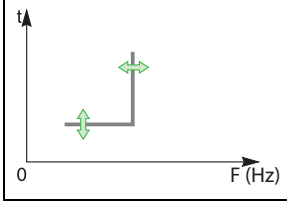
- if the circuit breaker is bottom-fed, the internal pickup voltage is suitable for underfrequency protection and circuit breaker closing.
- if the circuit breaker is top-fed, an external voltage input is required. The PTE option must be selected to perform the voltage measurement on the power source side.

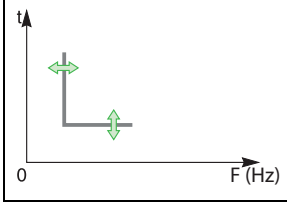
The protection trips if all below conditions are met:

- the value of frequency exceeds the setting
- the associated timer is elapsed.

Benefits

Underfrequency and overfrequency protections are suitable for generator use. The continuous monitoring of frequency enables appropriate action to be initiated to safeguard the operation of the installation during abnormal or critical situations, for example: load shedding, source change-over, and emergency generator starting.

MicroLogic 2.0 X - 5.0 X - 6.0 X - 7.0 X			
	**Underfrequency**	**ANSI 81U**	
	Frequency (Fmin)	Accuracy: ±0.5 %	40 to 65 Hz by step of 0.1 Hz
	Time setting (tFmin)	Max breaking time: 140 ms (with time delay set to 0) accuracy: ±2 %	0 to 300 s, by step of 0.01s

MicroLogic 2.0 X - 5.0 X - 6.0 X - 7.0 X			
	**Overfrenquency**	**ANSI 81O**	
	Frequency (Fmax)	Accuracy: ±0.5 %	40 to 70 Hz by step of 0.1 Hz
	Time setting (tFmax)	Max breaking time: 140 ms (with time delay set to 0) accuracy: ±2 %	0 to 300 s, by step of 0.01s

ANSI 32P—Reverse Active Power Protection

The Reverse Active Power Protection digital module monitors the active power.

Two-way protection based on calculated active power for the following applications:

- Active power protection to detect overloads and allow load shedding.
- Reverse active power protection:
  - To protect against generators running like motors when the generators consume active power.
  - To protect against motors running like generators when the motors supply active power.

NOTE: The reverse active power protection requires the MicroLogic X control unit to be supplied by an external 24 V dc power supply.

The positive sign of the active power is defined by the setting, and the same sign is used for active power measurement. By default the MicroLogic X control unit assigns the sign + to the active power when the power supply feeding the installation is connected to the top of the circuit breaker (top-fed circuit breaker).

The sign – is assigned when the power supply is connected to the bottom of the circuit breaker (bottom- fed circuit breaker). In these cases, the sign assigned by default (power sign parameter) must be changed with Ecoreach software.

The protection trips when:

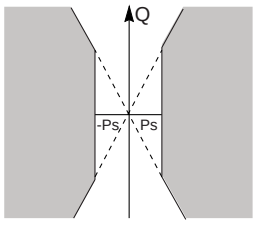
- The active power is negative.
- The value of active power exceeds the setting.
- The timer is elapsed.

The recommended settings are 2% to 6% of the rated power for turbines and 8% to 15% for diesel engines.

Benefits

This module monitors the mode of operation of a synchronous power generator connected to an external network or running in parallel with other generators. It trips the circuit breaker if the generator is back fed. It also monitors the active power exchange between separate parts of an electrical network, and will trip should there be an issue with the direction of electrical flow.

- Monitoring of the mode of operation of a synchronous power generator connected to an external network or running in parallel with other generators.
- Tripping as soon as the generator operates as a synchronous motor, driving its prime mover.
- Monitoring of the active power exchanged between separate parts of an electrical network.

MicroLogic 3.0X, 5.0X, 6.0X			
	**Reverse Active Power**	**ANSI Code 32P**	
	Active power	Accuracy: ±10%	50 kW to 5000 kW, by steps of 10 kW
	Time setting	• Max breaking time: 140 ms (with time delay set to 0) • Accuracy: ± 2 %	0 to 300 s, by steps of 0.05 s

ANSI 51—IDMTL Overcurrent Protection

The ANSI 49RMS/51 long-time overcurrent protection is provided as standard with any type of MicroLogic X control unit. This long time overcurrent protection meets the IEC 60947-2 standard and covers long time overcurrent selectivity for most electrical distribution applications. However, with some upstream protection device such as medium voltage fuse, it does not cover long time overcurrent selectivity. By selecting another shape of long time tripping curve such as an IDMTL (Inverse Definite Minimum Time Lag) tripping curve, it may be possible to achieve such selectivity.

Description

The ANSI 51 – IDMTL overcurrent protection Digital Module is used to generate either an alarm or a trip.

This digital module provides overcurrent protection based on one of the selected IDMTL tripping curves:

- DT: Definite Time (time-independant characteristics)
- SIT: Standard Inverse Time curve ($I^{0.02}t$)
- VIT: Very Inverse Time curve (It)
- EIT: Extremely Inverse Time curve (I^2t)
- HVF: High Voltage Fuse curve (I^4t)

IDMTL Overcurrent Protection (ANSI 51) is based on the true RMS current. This protection is implemented independently for each phase and the neutral. This protection is an overcurrent time dependent protection (except when Definite Time has been selected).

IDMTL overcurrent protection (ANSI 51) has definite time characteristics described page B-12. The protection generates the start, operate and trip events as described page C-4.

The protection trips if all below conditions are met:

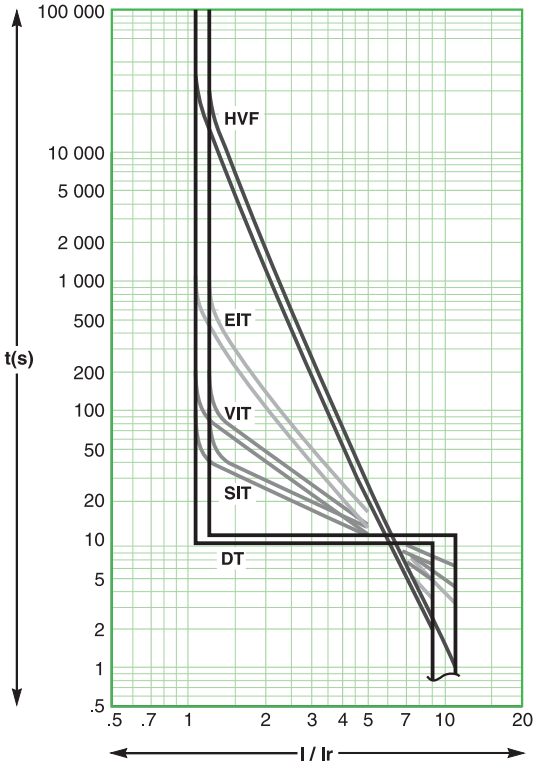
- the value of the current exceeds 1.05 x IDMTL Ir setting
- the timer (IDMTL tr) is elapsed (timer value is given for an overload of 6 x IDMTL Ir).

Benefits

The addition of one of the IDMTL tripping curves to the existing long-time overcurrent protection may facilitate the selectivity with an upstream protection device.

- Selectivity with an upstream low voltage protection relay where the long time protection is set at very low level by using SIT or VIT tripping curves.
- Selectivity with upstream fuses (High Voltage Fuse) by using HVF tripping curve.
- Protection with certain types of loads where the level of short circuit is very low by using DT tripping curve.

IDMTL



ANSI 67—Directional Overcurrent

For low voltage installation with multiple power sources running in parallel, the standard overcurrent protection is insufficient to achieve selectivity. In the example below, in case of short circuit on the transformer side, without the directional overcurrent protection, both circuit breaker will trip and therefore the busbar is no more powered. With the directional overcurrent protection, it is possible to achieve selectivity thanks to the detection of the direction of the short circuit and therefore the busbar will keep powered.

Description

The directional overcurrent protection (ANSI 67) Digital Module is used to generate either an alarm or a trip. There are two independant protections : reverse direction overcurrent and forward direction overcurrent. Per convention, reverse direction is given for an overcurrent flowing from the bottom connection to the top connection of the MasterPacT MTZ. Forward direction is given for an overcurrent flowing from the top connection to the bottom connection of the MasterPact MTZ. Directional overcurrent protection detects the direction of the short-circuit current and is an overcurrent time-independent protection.

The Directional overcurrent protection requires the MicroLogic X control unit to be supplied by an external 24 V dc power supply. The protection generates the start, operate and trip events as described page C-4.

The protection trips if all below conditions are met:

- the value of the current exceeds the setting (Ifw or Irv)
- the associated timer (tifw or tirv) is elapsed
- The direction of the short-circuit current is detected:
  - from the top connection to the bottom connection of the circuit breaker: forward directional overcurrent protection trips
  - from the bottom connection to the top connection of the circuit breaker: reverse directional overcurrent protection trips

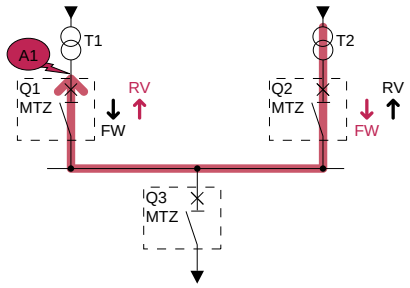
Benefits

Avoid black-out in case of short circuit on the source side in low voltage installation with multiple power sources running in parallel.

Avoid black-out in case of short circuit on the bus bar side in low voltage installation with multiple power sources running in parallel and with a bus tie.

MicroLogic 2.0 X - 5.0 X - 6.0 X - 7.0 X		
Forward Directional overcurrent	**ANSI 67**	
Current setting (A)	Ifw	0.5 x In to 10 x In
Time setting (s)	tIfw	0.1 s to 4 s, step 0.1 s
ReverseDirectional overcurrent	**ANSI 67**	
Current setting (A)	Irv	0.5 x In to 10 x In
Time setting (s)	tIrv	0.1 s to 4 s, step 0.1 s

Example: 2 Sources—No Tie



Fault in A1:

The short-circuit is fed by T2.

Without directional overcurrent protection, Q1 and Q2 shall trip and the busbar is no more powered.

Goal:

- Trip Q1 in order to clear fault.
- Keep the Q2 closed in order to keep the busbar powered.

Solution:

Implement directional overcurrent protection on Q1 and Q2 in order to detect reverse direction short-circuit.

Implementation:

Reverse directional overcurrent protection on Q1 shall clear the fault and must trip before the short time protection on Q2 in order to keep Q2 closed.

ANSI 51N/51G—Ground-Fault Alarm

The Ground-Fault Alarm digital module provides an integrated ground fault alarm.

A phase-to-ground fault can be the result of the slow degradation of an insulating component of electrical equipment or the presence of a foreign body inside the equipment. For such events the fault resistance can be significantly high, enough to maintain the ground-fault current below the settings of the phase-to-ground fault protections. No tripping occurs and the installation remains energized with a potential risk of local overheating and damage. The ground-fault alarm with appropriate settings can pick up such critical resistive ground faults, allowing the maintenance staff to take appropriate actions.

The module operates using the same sensors as the ground-fault protection.

The alarms are independent from the ground fault trip protections and have their own settings. The ground-fault alarm can be used with MicroLogic 3.0 X, 5.0 X, 6.0 X.

When the ground-fault alarm digital module is installed in the MicroLogic X control unit, the ground-fault alarm is automatically activated.

The ground fault current is detected in two ways:

- By summation of either the three phase currents or the three phase currents and the neutral.
- By means of the external sensor SGR installed on the link connecting the ground to the neutral point of the power transformer feeding the installation. The SGR sensor must be connected to the MicroLogic X control unit through the MDGF interface module.

Benefits

The ground fault alarm digital module allows early detection of resistive ground current by detecting gradually increasing ground currents up to the settings of the phase-to-ground fault protections.

The alarms allow the maintenance staff to take appropriate action at the right time in order to safeguard the installation.

MicroLogic 3.0X, 5.0X, 6.0X Control Unit		
Ground-Fault Alarm	**ANSI Code 51N**	
Pick up (A)	Accuracy: ±10%	Ig = 120 A to 1200 A by steps of 1 A
Time setting		1 to 10 s by steps of 0.1 s

ERMS—Energy Reducing Maintenance Settings

Description

The ERMS—Energy Reducing Maintenance Settings digital module is used to lower the protection settings in order for the MasterPacT MTZ circuit breaker to trip faster. Should an internal arc fault occur downstream to the circuit breaker, the reduced fault clearing time decreases the amount of energy generated by the electrical arc.

The ERMS function can be engaged/disengaged through an external lockable selector switch with an additional dedicated ESM hardware module (ERMS Switch Module) and/or through the MasterPacT MTZ Mobile App. Activating ERMS will change the trip curve from A or B to ERMS protection L, S, I and/or G trip settings.

ERMS settings are set to the minimum values at the factory. ERMS setting values need to be adjusted according to the arc flash study. Setting changes may be made with the Mobile app or Ecoreach software. When ERMS is engaged, the MicroLogic X embedded HMI backlight is blue and the ERMS LED is illuminated.

NOTE: The ESM hardware module is field-installable by Schneider-Electric Services only.

When ERMS is engaged:

- The MicroLogic X control unit front face has a blue LED indicating ERMS.
- The MicroLogic X control unit embedded display has a blue backlight.
- A light can be connected to the ESM hardware module as an external visual indicator.
- ERMS notice is sent to a PC which has Ecoreach software.
- ERMS notice is sent through the customer communications network (Ethernet or Modbus SL [RTU]).

Benefits

The ERMS function is one of the approved methods in the NEC 240.87 (National Electric Code) to reduce arc energy. ERMS can be engaged/disengaged wirelessly with a smart device or with an external switch.

ERMS Settings	Range	Factory Settings[45]
Ir ERMS	Same as: L protection	In
tr ERMS	Same as: L protection	0.5
Isd ERMS	Same as: S protection	1.5 x ir
tsd ERMS	Same as: S protection	0
Ii ERMS	Same as: I protection	2
Ii ERMS operating time	Same as: I protection	fast
Ig ERMS	Same as: G protection	0.2
tg ERMS	Same as: G protection	0

45. ERMS LSIG factory settings.

MasterPacT MTZ Circuit Breaker Accessories

Overview of MasterPacT MTZ Accessories

MasterPacT MTZ Accessories Availability

Indicates Drawout Circuit Breaker

Indicates Fixed Circuit Breaker

MasterPacT MTZ Circuit Breaker Accessories			
Accessory	**Circuit Breaker**	**Version**	
		Fixed	**Drawout**
Design and Installation - Connection > See MasterPacT MTZ Connections, page 66			
Horizontal and vertical rear connection	MTZ1/2/3	◉	◉
Front connection	MTZ1/2/3	◉	◉
Vertical-connection adapters	MTZ1	◉	◉
Cable-lug adapters	MTZ1	◉	◉
Spreaders	MTZ1	◉	◉
Disconnectable front connection adapter	MTZ2/3	◉	—
Lugs for 240 mm^2 or 300 mm^2 cables	MTZ1	◉	◉
Interphase barriers	MTZ1/2/3	◉	◉
Arc chute cover (CC)	MTZ1	◉	—
Brackets for mounting	MTZ2/3	◉	—
Operation Efficiency - Signalling > See MasterPacT MTZ Signalling Accessories, page 72			
ON/OFF indication contacts (OF)	MTZ1/2/3	◉	◉
Fault-trip indication contact (SDE)	MTZ1/2/3	◉	◉
Combined connected/closed contacts (EF)	MTZ2/3	—	◉
Cradle switches (CE, CD, CT)	MTZ1/2/3	—	◉
Ready-to-close contact (PF)	MTZ1/2/3	◉	◉
ERMS switch module (ESM)	MTZ1/2/3	◉	◉
Mechanical operation counter (CDM)	MTZ1/2/3	◉	◉
Operation Efficiency - Controlling > See MasterPacT MTZ Controlling Accessories, page 82			
Diagnostic and communicating shunt close (XF diag&com)	MTZ1/2/3	◉	◉
Shunt close (XF)	MTZ1/2/3	◉	◉

MasterPacT MTZ Circuit Breaker Accessories			
Accessory	**Circuit Breaker**	**Version**	
		Fixed	**Drawout**
Diagnostic and communicating shunt trip (MX diag&com)	MTZ1/2/3	◉	◉
Shunt trip (MX)	MTZ1/2/3	◉	◉
Diagnostic undervoltage release (MN diag)	MTZ1/2/3	◉	◉
Undervoltage release (MN)	MTZ1/2/3	◉	◉
Non-adjustable delay unit (R)	MTZ1/2/3	◉	◉
Adjustable delay unit (Rr)	MTZ1/2/3	◉	◉
Isolation module	MTZ1/2/3	◉	◉
Spring charging motor (MCH)	MTZ1/2/3	◉	◉
Electrical reset option (RES)	MTZ1/2/3	◉	◉
Automatic reset option (RAR)	MTZ1/2/3	◉	◉
Electrical closing pushbutton (BPFE)	MTZ1/2/3	◉	◉
People and Property Protection - Locking and Interlocking > See **MasterPacT MTZ Locking and Interlocking Accessories, page 97**			
ON/OFF pushbutton locking (VBP)	MTZ1/2/3	◉	◉
OFF position locking (VSPO-VCPO)	MTZ1/2/3	◉	◉
Cradle locking in disconnected position by padlock	MTZ1/2/3	—	◉
Cradle locking in disconnected position: by keylock (VSPD)	MTZ1/2/3	—	◉
Optional connected/disconnected/test position locking	MTZ1/2/3	—	◉
Safety shutters (VO)	MTZ1/2/3	—	◉
Shutter position indication and locking (VIVC)	MTZ2/3	—	◉
Cable-type door interlock (IPA)	MTZ1/2/3	◉	◉
Door interlock (VPEC)	MTZ1/2/3	—	◉
Racking interlock (VPOC)	MTZ1/2/3	—	◉
Racking interlock between crank and OFF pushbutton (IBPO)	MTZ2/3	—	◉

MasterPacT MTZ Circuit Breaker Accessories			
Accessory	**Circuit Breaker**	**Version**	
		Fixed	**Drawout**
Cradle rejection kit	MTZ1/2/3	—	◉
People and Property Protection - Circuit Protection > See MasterPacT MTZ Circuit Protection Accessories, page 102			
External sensor for ground-fault protection (ENCT)	MTZ1/2/3	◉	◉
External sensor for source ground-return (SGR) protection	MTZ1/2/3	◉	◉
People and Property Protection - Operation Protection > See MasterPacT MTZ Operation and Mechanical Protection Accessories, page 104			
Automatic spring discharge before circuit breaker removal (DAE)	MTZ2/3	—	◉
Grounding kit (KMT)	MTZ2/3	◉	◉
People and Property Protection - Mechanical Protection > See MasterPacT MTZ Operation and Mechanical Protection Accessories, page 104			
Terminal cover (CB)	MTZ1/2/3	—	◉
Escutcheon (CDP)	MTZ1/2/3	◉	◉
Blanking plate for escutcheon (OP)	MTZ1/2/3	◉	◉
Transparent cover for escutcheon (CP)	MTZ1/2/3	—	◉
Power Availability and Reliability - Power Supplies > See MasterPacT MTZ Power Supply Accessories, page 107			
Voltage power supply (VPS)	MTZ1/2/3	◉	◉
External 24 Vdc power supply module (AD)	MTZ1/2/3	◉	◉
Battery module (BAT)	MTZ1/2/3	◉	◉
Mobile Power Pack by APC	MTZ1/2/3	◉	◉
Spare internal battery	MTZ1/2/3	◉	◉

MasterPacT MTZ Circuit Breaker Mounting Versions

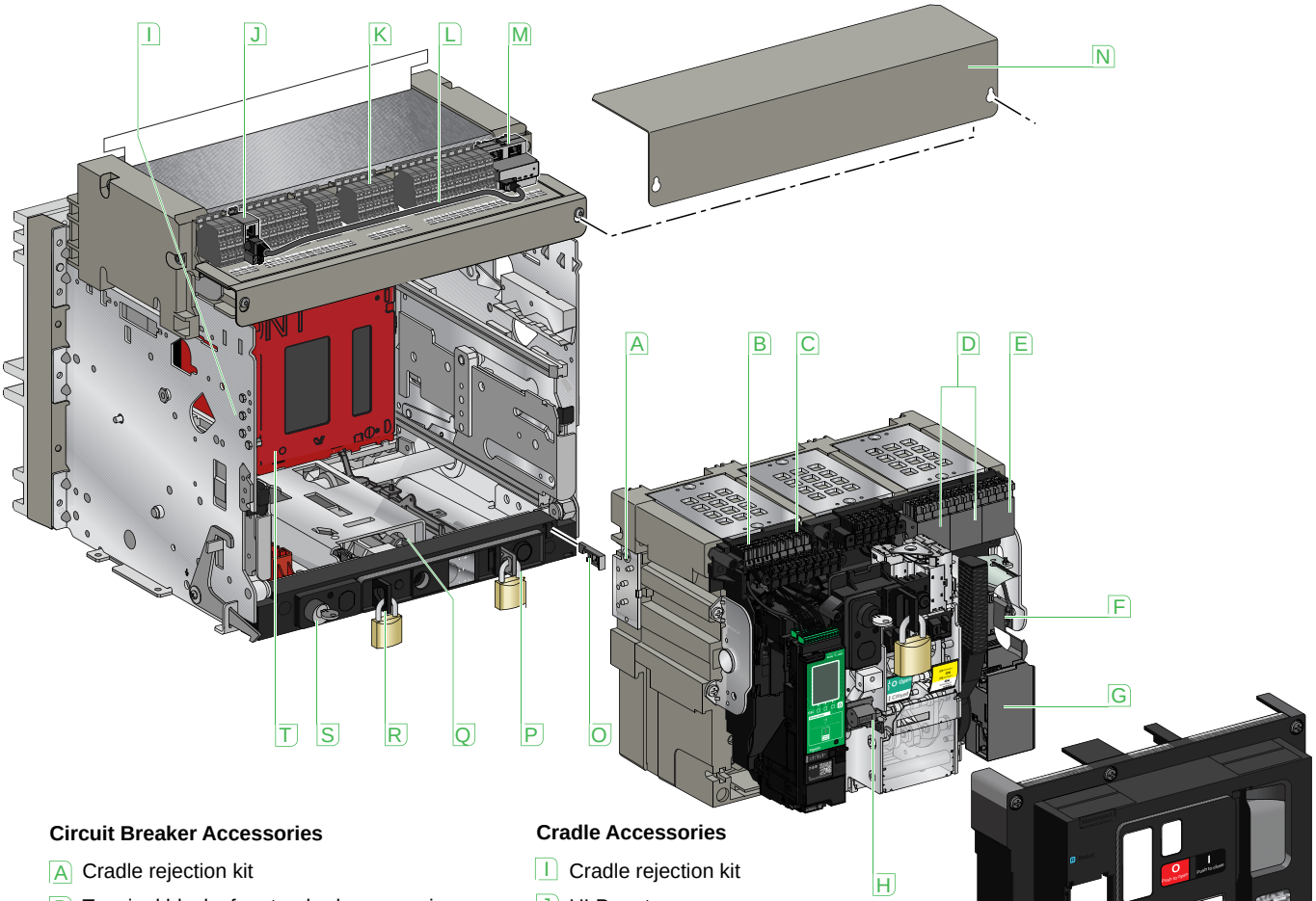
MasterPacT circuit breakers are available in fixed and drawout versions.

The drawout version is preferred in most applications due to its following benefits:

- Visible separation of the power contacts by racking the device out.
- Convenient and complete access to the device for periodic maintenance.
- Easy device removal and replacement.

MasterPacT MTZ Accessories Locations

MasterPacT MTZ2/3 Drawout Circuit Breaker (as an example)



Circuit Breaker Accessories

- A Cradle rejection kit
- B Terminal blocks for standard accessories
- C Terminal blocks for optional accessories
- D Optional block of four indication contacts (OF) or combined connected/closed contacts (EF)
- E Standard block of four indication contacts (OF)
- F Grounding kit (KMT)
- G Spring charging motor (MCH)
- H Mechanical operation counter (CDM)

Cradle Accessories

- I Cradle rejection kit
- J ULP port
- K Terminal blocks for optional accessories
- L Cord between ULP port and EIFE interface
- M Embedded Ethernet interface (EIFE)
- N Terminal cover (CB)
- O Racking interlock (VPOC)
- P Shutter position indication locking (VIVC)
- Q Latch to lock the device in any position
- R Cradle locking in disconnected position by padlock
- S Cradle locking in disconnected position by keylock (VSPD)
- T Safety Shutter (VO)

MasterPacT MTZ Accessory Design and Installation

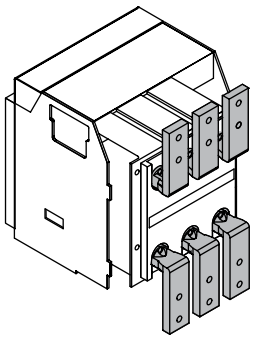
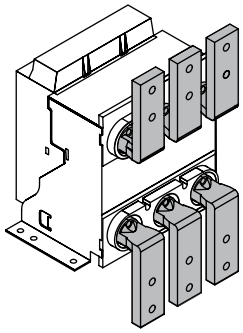
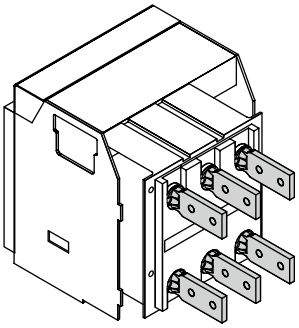
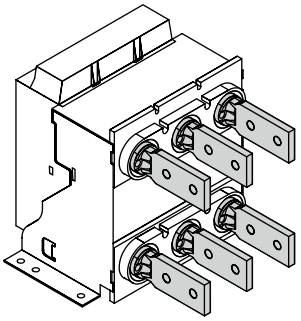
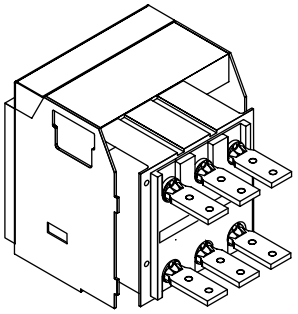
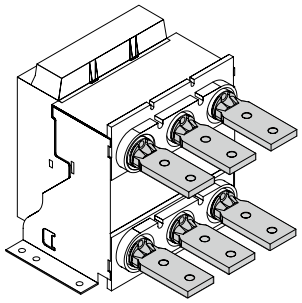
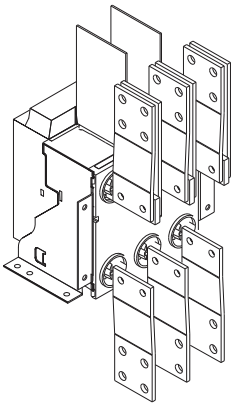
MasterPacT MTZ Connections

MasterPacT MTZ provides three types of basic connections with additional accessories to adapt to different connection needs and simplify installation.

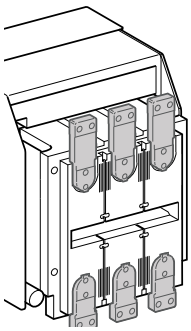
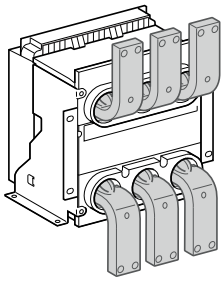
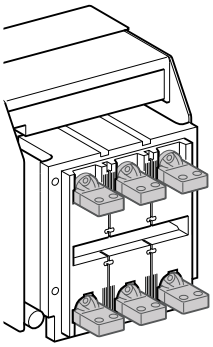
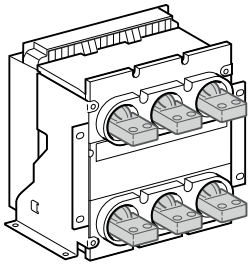
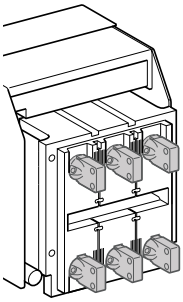
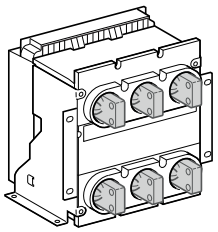
- Upstream and downstream can have different connection types (mixed connection).
- Changing between horizontal and vertical rear connection can be done by simply turning the terminal by 90°.
- MasterPacT MTZ circuit breakers can be connected with bare-copper, tinned-copper or tinned-aluminum conductors. No special treatment is required.

MasterPacT MTZ and MasterPacT NT/NW devices use the same connections, allowing MasterPacT MTZ to easily replace MasterPacT NT/NW devices.

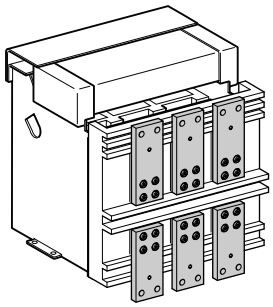
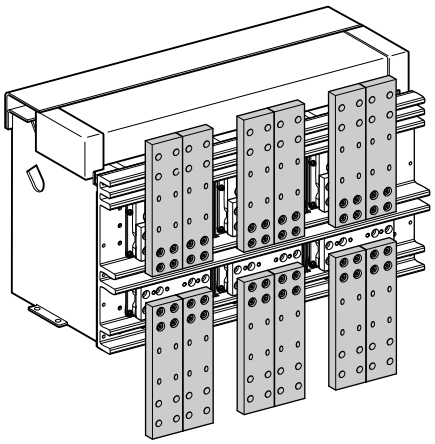
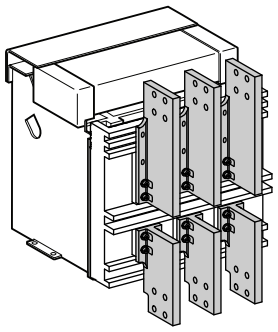
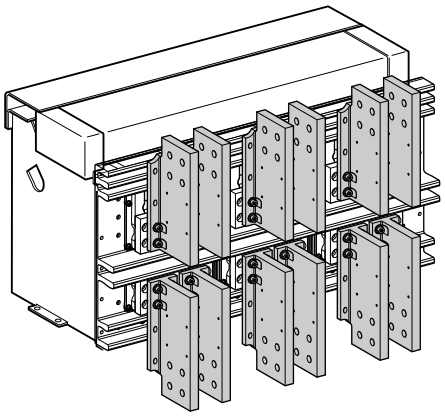
MasterPacT MTZ1 UL Listed/ANSI Certified Connections

MasterPacT MTZ1 UL Listed/ANSI Certified 3P/4P Fixed and Drawout Circuit Breakers		
Connector Type	**Drawout Circuit Breakers**	**Fixed Circuit Breakers**
Front-Connected Flat (FCF) 800 to 1200 A		
Rear-Connected “T” Vertical (RCTV) 800 to 1200 A		
Rear-Connected “T” Horizontal (RCTH) 800 to 1200 A		
Rear-Connected Vertical 1600 A	N/A	

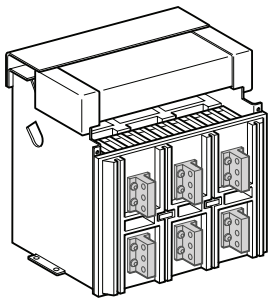
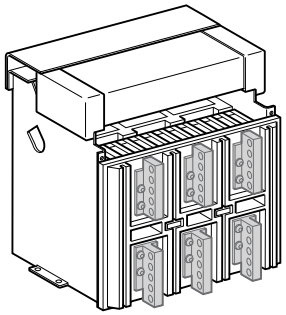
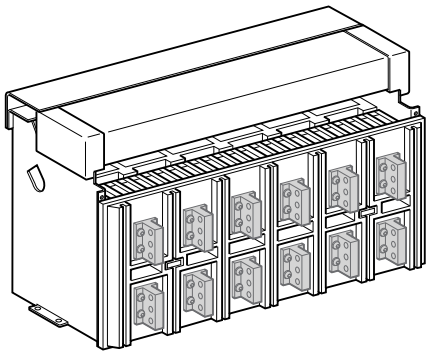
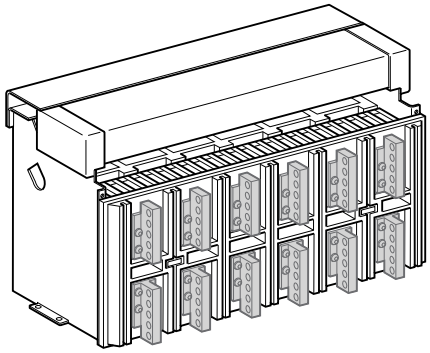
MasterPacT MTZ1 IEC Rated Connections

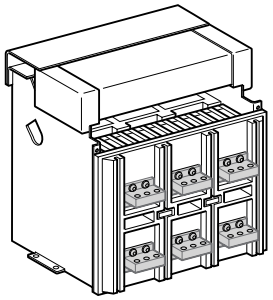
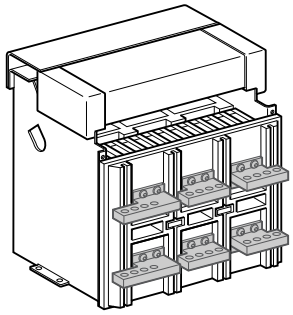
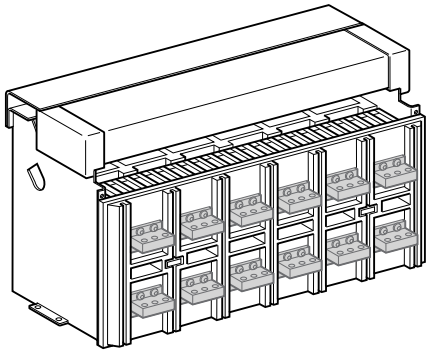
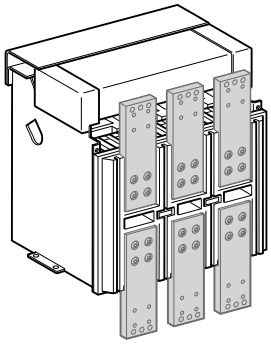
MasterPacT MTZ1 IEC Rated 3P/4P Fixed and Drawout Circuit Breakers		
Connector Type	**Drawout Circuit Breakers**	**Fixed Circuit Breakers**
Front-Connected Flat (FCF) 800 to 1600 A		
Rear-Connected “T” Horizontal (RCTH) 800 to 1600 A		
Rear-Connected “T” Vertical (RCTV) 800 to 1600 A		

MasterPacT MTZ2/3 UL Listed/ANSI Certified Connections

MasterPacT MTZ2 and MTZ3 UL Listed/ANSI Certified 3P/4P Drawout Circuit Breakers (Rear Connections)		
Connector Type	**Ampere Rating**	**3P Layout**
Front-Connected Flat (FCF)	800 to 2000 A	
	3200 A (L1) 4000 A	
Front-Connected “T” (FCT)	800 to 3000 A	
	3200 A (L1) 4000 to 5000 A	

MasterPacT MTZ2/3 IEC Rated Connections

MasterPacT MTZ2 and MTZ3 IEC Rated 3P/4P Drawout Circuit Breakers		
Connector Type	**Ampere Rating**	**3P Layout**
Rear-Connected “T” Vertical (RCTV)	800 to 3200 A	
	4000 A	
	5000 A	
	6300 A	

MasterPacT MTZ2 and MTZ3 IEC Rated 3P/4P Drawout Circuit Breakers		
Connector Type	**Ampere Rating**	**3P Layout**
Rear-Connected “T” Horizontal (RCTH)	800 to 3200 A	
	4000 A	
	4000b, 5000 A	
Front-Connected Flat (FCF)	800 to 3200 A	

MasterPacT MTZ Operation Accessories

MasterPacT MTZ Signalling Accessories

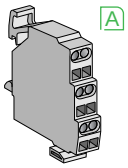
Signalling accessories provide status indications for both the device and the cradle. Combinations of contacts are possible depending on the application requirements.

- Open/closed position of the circuit breaker main poles (OF).
- Overcurrent trip of the circuit breaker (SDE).
- Combined connected/closed position of the circuit breaker (EF) (MTZ2/MTZ3 only).
- Connected, disconnected and test positions of the cradle (CE, CD, CT).
- Threshold overruns or status change through the programmable contacts (M2C).
- Indication that the Energy Reducing Maintenance Settings (ERMS) is engaged through the ERMS switch module (ESM).
- Ready-to-close contact (PF).
- Mechanical operation counter (CDM).

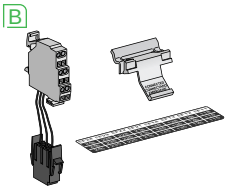
OF, EF, CE, CD, CT, SDE and PF are available:

- In the standard version for relay applications.
- In a low level version that will perform better with PLC's with low level signals.

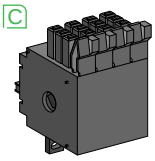
MasterPacT MTZ Signalling Accessories Location



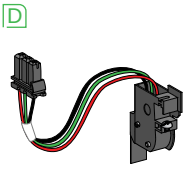
Cradle Position Switches (CE, CD, and CT), page 76



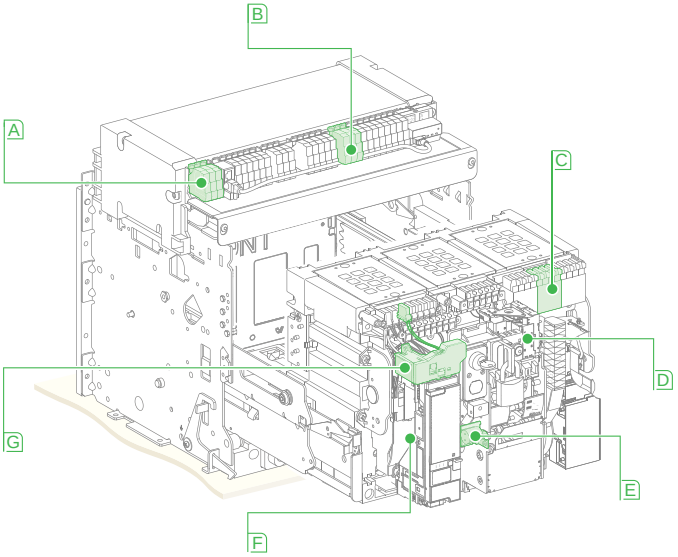
Combined Connected/Closed Contacts (EF), page 75

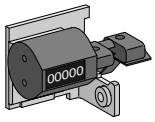


ON/OFF Indication Contacts (OF), page 73

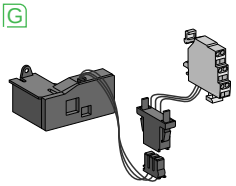


Ready-to-Close Contacts (PF), page 81t

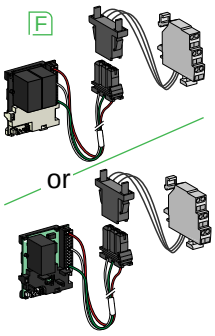




Mechanical Operation Counter (CDM), page 81



Overcurrent Trip Indication Contacts (SDE), page 74



M2C Programmable Contacts, page 80 or ERMS Switch Module (ESM), page 80

ON/OFF Indication Contacts (OF)

Microswitch Type ON/OFF Indication Contacts (OF) (MTZ1)

Rotary Type ON/OFF Indication Contacts (OF) (MTZ2 and MTZ3)

Two types of contacts indicate the ON and OFF position of the circuit breaker:

- Microswitch-type changeover contacts in standard or low level versions for MasterPacT MTZ1 circuit breakers.
- Rotary-type changeover contacts for MasterPacT MTZ2/MTZ3 circuit breakers. They are driven directly by a mechanism and switch when the minimum isolation distance between the main poles of the circuit breaker is reached.
- Four OF contacts are provided in the basic configuration for all MasterPacT circuit breakers.
- For MTZ1, no additional OF contacts can be added. However, low-level OF contacts can replace the standard OF contacts. A mix of low-level contacts and standard contacts is possible.
- For MTZ2/3, the rotary-type changeover contacts can be used in both standard and low-level versions. In addition to the four OF contacts provided for the basic configuration, two optional blocks of four contacts can be added on the circuit breaker, giving twelve OF contacts maximum.

  NOTE: When an EIFE is installed it takes up two OF positions, reducing the maximum number of OF contacts to ten.

ON/OFF Indication Contacts OF					
Circuit Breaker Type				**MTZ1**	**MTZ2/3**
Supplied as Standard (Form C)				4	4
Maximum Number of Contacts				4	12
Breaking Capacity at a Power Factor (p.f.) of 0.3	Standard (100 mA/24 V minimum load)	Vac	240/380	6 A	10 A
			480	6 A	10 A
			600/690	6 A	6 A
		Vdc	24/48	2.5 A	10 A
			240	0.5 A	10 A
			380	0.3 A	3 A
	Low-Level (1 mA/4 V minimum load with a maximum current and voltage of 100 mA/10 V. Note: If the maximum voltage and current is exceeded, the low-level function of the switch will be lost but the switch will continue to function as a standard switch with the following specifications.	Vac	24/48	5 A	6 A
			240	5 A	6 A
			380	5 A	3 A
		Vdc	24/48	5/2.5 A	6 A
			125	0.5 A	6 A
			250	0.3 A	3 A

Overcurrent Trip Indication Contacts (SDE)

Additional Overcurrent Trip Indication Contacts (SDE)

Circuit breaker tripping following a fault is signalled by:

- Local indication given by a blue mechanical fault indicator (reset).
- Remote indication given by a changeover contact SDE.

Following tripping, the mechanical indicator must be reset before the circuit breaker can be closed. One standard SDE (SDE1) is supplied in the basic circuit breaker. An optional second SDE (SDE2, standard or low level) can be added.

NOTE: SDE2 is incompatible with the electrical reset after overcurrent trip option (RES), see Electrical Reset After Overcurrent Trip (RES), page 94.

Overcurrent Trip Indication Contacts SDE				
Supplied as Standard		1a/1b Form C		
Maximum Number of Contacts		2		
Breaking Capacity at a Power Factor (p.f.) of 0.3	Standard (100 mA/24 V minimum load)	Vac	240/380	5 A
			480	5 A
			600/690	5 A
		Vdc	24/48	3 A
			240	0.3 A
			380	0.15 A
	Low-Level (2 mA/15 V Minimum Load)	Vac	24/48	3 A
			240	3 A
			380	3 A
		Vdc	24/48	3 A
			125	0.3 A
			250	0.15 A

Combined Connected/Closed Contacts (EF)

Combined Contacts

The contact combines the device connected and closed information to produce the circuit closed information.

NOTE: Ordering of additional OF contacts is required if EF is selected.

Connected/Closed Contacts EF (MTZ2/MTZ3 only)				
Maximum Number of Contacts		8a/8b Form C		
Breaking Capacity at a Power Factor (p.f.) of 0.3	Standard (100 mA/24 V minimum load)	Vac	240/380	6 A
			480	6 A
			600/690	6 A
		Vdc	24/48	2.5 A
			125	0.8 A
			250	0.3 A
	Low-Level (2 mA/15 V Minimum Load)	Vac	24/48	5 A
			240	5 A
			380	5 A
		Vdc	24/48	2.5 A
			125	0.8 A
			250	0.3 A

Cradle Position Switches (CE, CD, and CT)

Connected / Disconnected / Test Position Cradle Switches (CE, CD and CT)

Three series of optional auxiliary switches are available for the cradle, both in standard and low level options:

- Cradle position switches to indicate the connected position (CE).
- Cradle position switches to indicate the disconnected position (CD). This position is indicated when the required clearance for isolation of the power and auxiliary circuits is reached.
- Cradle position switches to indicate the test position (CT). In this position, the power circuits are disconnected and the auxiliary circuits are connected.

Cradle Position Switches								
			MTZ1			MTZ2, MTZ3		
			CE	CD	CT	CE	CD	CT
Maximum Push-In Switches with Standard Actuators			3	2	1	3	3	3
With Additional Actuators			—	—	—	9	0	0
						6	3	0
						3	6	0
						6	0	3
Breaking Capacity at a Power Factor (p.f.) of 0.3	Standard (100 mA/24 V minimum load)	Vac	240			8 A		
			380			8 A		
			480			8 A		
			600/690			6 A		
		Vdc	24/48			2.5 A		
			125			0.8 A		
			250			0.3 A		
	Standard (100 mA/24 V minimum load)	Vac	24/48			5 A		
			240			5 A		
			380			5 A		
		Vdc	24/48			2.5 A		
			125			0.8 A		
			250			0.3 A		

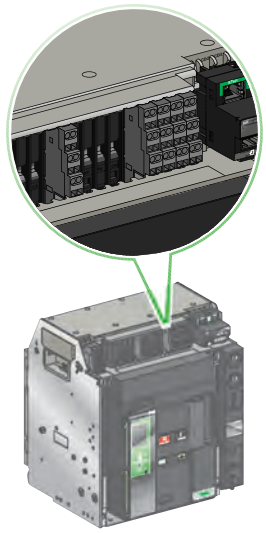
Cradle Switch Block Position—Push-In Connectors

MTZ1 Push-In Connector Cradle Switch Block Position

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
CE	CE	COM	UC1	UC2	SDE	M2C	UC3	SDE	MX	MX	XF	PF	MCH	OF	OF	OF	OF	CD	CD	CE	CT
					RES	UC4			MN									EIFE			
						ESM															

As shown above, the cradle switches can be installed in 6 positions: 1, 2, 19, 20, 21 and 22. Each position corresponds to a particular type of auxiliary contact (CE, CD, CT).

When an EIFE is installed, the CD, CE, CT switches are directly connected to EIFE which makes the information available through the Ethernet communication bus.



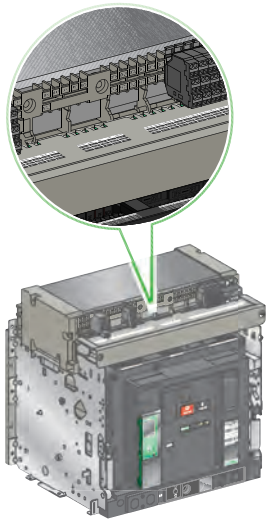
MTZ1 Cradle Switch Block Position

MTZ1 EIFE Information		
Position	**Without EIFE**	**With EIFE**
1	None or 1 CE	None or 1 CE
2	None or 1 CE	None or 1 CE
19	None or 1 CD	None
20	None or 1 CD	None
21	None or 1 CE	None
22	None or 1 CT	None

NOTE: Any standard contact can be replaced by a low-level contact except for the ones provided by EIFE.

MTZ2/MTZ3 Push-In Connector Cradle Switch Block Position

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
CD	CD	CD	COM	UC1	UC2	SDE	UC4	UC3	M2C	SDE	CE	CE	CE	MN	MX	XF	PF	MCH	OF	OF	OF	OF	OF	OF	OF	OF	OF	OF	OF	OF	CT	CT	CT
CE	CE	CE				RES			ESM		CT	CT	CT	MX					EF	EF	EF	EF	EF	EF	EF	EF						CE	CE	CE
																															CD	CD	CD
																									OF	OF	OF	OF	EIFE				



MTZ2 or MTZ3 Cradle Switch Block Position

As shown above, the cradle switches can be installed in three blocks:

- Position 1, 2, 3 for the first block.
- Position 12, 13, 14 for the second block.
- Position 32, 33, 34 for the third block.
- Blue boxes indicate options available when EIFE is ordered.

As standard, the first block can be installed with CD (three maximum), the second block can be installed with CE (three maximum), and the third block can be installed with CT (three maximum).

Changing the functions of cradle switches is possible. To make the change, the first block can be replaced by CE, the second block can be replaced by CT and the third block can be replaced by CE or CD.

Mixing of CE, CD, CT in one block is not possible. For example, installing 1CD and 2CE in the first block is not possible.

When EIFE is installed, it takes the place of CT, CE and CD switches at positions 32, 33 and 34.

The CD, CE, CT switches are directly connected to EIFE which makes the information available through the Ethernet communication bus. As EIFE also takes up positions 30 and 31, OF cannot be installed at these positions and the maximum number of OF contacts is limited to ten.

MasterPacT MTZ2 and MTZ3 EIFE Information		
Position	**Without EIFE**	**With EIFE**
1: 1, 2, 3	None or 1CD or 2CD or 3CD or 1CE or 2CE or 3CE	None or 1CD or 2CD or 3CD or 1CE or 2CE or 3CE
2: 12, 13, 14	None or 1CE or 2CE or 3CE or 1CT or 2CT or 3CT	None or 1CE or 2CE or 3CE or 1CT or 2CT or 3CT
3: 32, 33, 34	None or 1CT or 2CT or 3CT or 1CE or 2CE or 3CE or 1CD or 2CD or 3CD	None

NOTE: Any standard contact can be replaced by a low level contact except for the ones provided by EIFE.

Cradle Switch Block Position—Ring Terminal Connectors

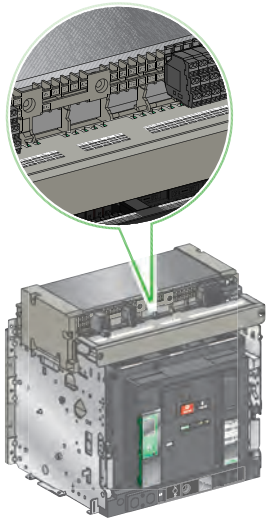
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
CD	CD	CD	COM	UC1	UC2	SDE	SDE	UC3	M2C	M2C	CT	SDE	SDE	MN	MX	MX	XF	XF	PF	CE	MCH	MCH	OF	OF	OF	OF	OF	OF	OF	OF	CE	CE	CE
						RES			ESM	ESM				MX																			
																									OF	OF	OF	OF	EIFE				

As shown above, the cradle switches can be installed in three blocks:

- Positions 1, 2, and 3 are available for CD switches.
- Position 12 is available for the CT switch option.
- Position 21 is available for the CE switch option.
- Blue boxes indicate options available when the EIFE is ordered.

When EIFE is installed, it takes the place of the CE switches at positions 32, 33, and 34.

The CD, CE, CT switches are directly connected to EIFE which makes the information available through the Ethernet communication bus.



MTZ2 or MTZ3 Cradle Switch Block Position

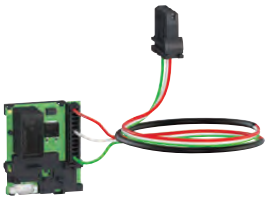
M2C Programmable Contacts

M2C programmable contacts: circuit breaker internal relay with two contacts

The M2C optional module (two contacts) can be used to signal threshold overruns or status changes. The assignment of the two contacts can be configured by using EcoStruxure Power Commission Software. The M2C optional module requires the MicroLogic X control unit to be supplied by an external 24 Vdc power supply. When the M2C module is installed, the ESM hardware module cannot be installed.

M2C Programmable Contacts Characteristics MTZ1, MTZ2, MTZ3		
M2C	**MTZ1, MTZ2, MTZ3**	**Output**
Rated voltage	Vac	250 V / 3 A
	Vdc	30 V / 3 A
Max breaking voltage	Vac	277 V / 3 A
Max load breaking capacity	Vac	277 V / 3 A
	Vdc	30 V / 3 A
Minimum load	Vdc	5 V / 10 mA

ERMS Switch Module (ESM)



ERMS switch module (ESM)

The ESM hardware module is required to use the external lockable selector switch to engage/disengage the Energy Reducing Maintenance Setting (ERMS) function. It is equipped with one input dedicated to the ERMS selector switch and one output to activate an external pilot light when the ERMS is engaged.

The ESM hardware module requires the MicroLogic X control unit to be supplied by an external 24 Vdc power supply. When the ESM hardware module is installed, the M2C optional module's two contacts cannot be installed. In such applications, it is recommended to use an IO module for programmable contact functions.

The ESM module comes standard with the initial order of an ERMS digital module.

ESM	MTZ1, MTZ2, MTZ3	Output	Input
Rated voltage	Vac	250 V / 3 A	24–110 V
	Vdc	30 V / 3 A	24 V
Max breaking voltage	Vac	277 V / 3 A	—
Max load breaking capacity	Vac	277 V / 3 A	—
	Vdc	30 V / 3 A	—
Minimum load	Vdc	5 V / 10 mA	—

Ready-to-Close Contacts (PF)

Ready-to-close contacts (PF)

The ready-to-close position switch indicates that the following conditions are met and the circuit breaker can be closed:

- The circuit breaker is open.
- The closing springs are charged.
- There is no standing closing or opening order.

Ready-to-Close Contacts Characteristics			
Maximum Number	**1**		
Breaking Capacity at a Power Factor (p.f.) of 0.3[46]	Standard Minimum load: 100 mA/24 V	240 Vac	5 A
	Low-level Minimum load: 2 mA/15 V	240 Vac	3 A

Mechanical Operation Counter (CDM)

Mechanical operation counter (CDM)

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

This option is required for source-changeover systems.

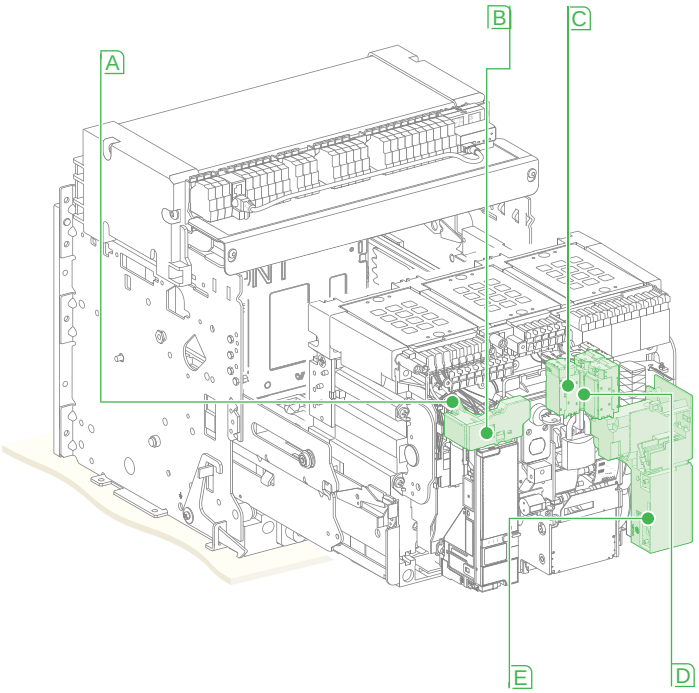
46. Utilization category according IEC 60947-5-1.

MasterPacT MTZ Controlling Accessories

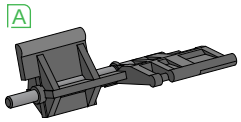
Control accessories provide multiple ways of controlling the circuit breaker and the possibility for remote operation. Two control devices are presented here:

- Remote On/Off
- Remote reset after overcurrent tripping

MasterPacT MTZ Controlling Accessories Locations (MTZ2 Drawout Example)

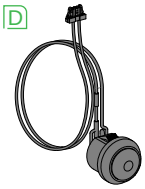


A



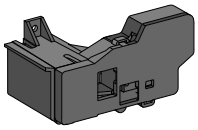
Automatic Reset After Overcurrent Trip (RAR), page 94

D



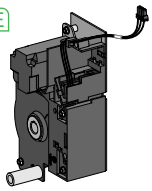
Electrical Closing Pushbutton (BPFE), page 93

B

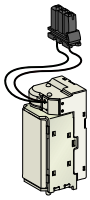


Electrical Reset After Overcurrent Trip (RES), page 94

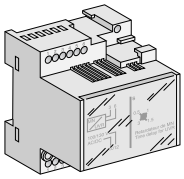
E



Spring Charging Motor (MCH)

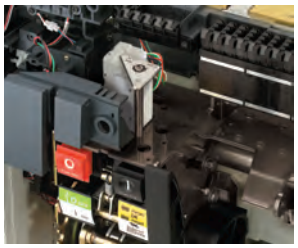


Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Diagnostic and Communicating Coils, page 89Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Basic Coils, page 89



Undervoltage Release Delay (MN Delay Units), page 91

Remote ON/OFF Control Accessory



Various remote ON/OFF configurations are possible using different combinations of the accessories below.

- **Diagnostic & Communicating Coils** with diagnostic and communication functions in addition to opening and closing the device:
  - A diagnostic and communicating shunt close (XF diag&com).
  - A diagnostic and communicating shunt trip (MX diag&com).
  - A second diagnostic and communicating shunt trip (MX2 diag&com) or a diagnostic undervoltage release (MN diag). The second shunt trip (MX2 diag&com) and the undervoltage release (MN diag) provide only the diagnostic function. The control functions over the communication network for opening and closing the device cannot be performed.

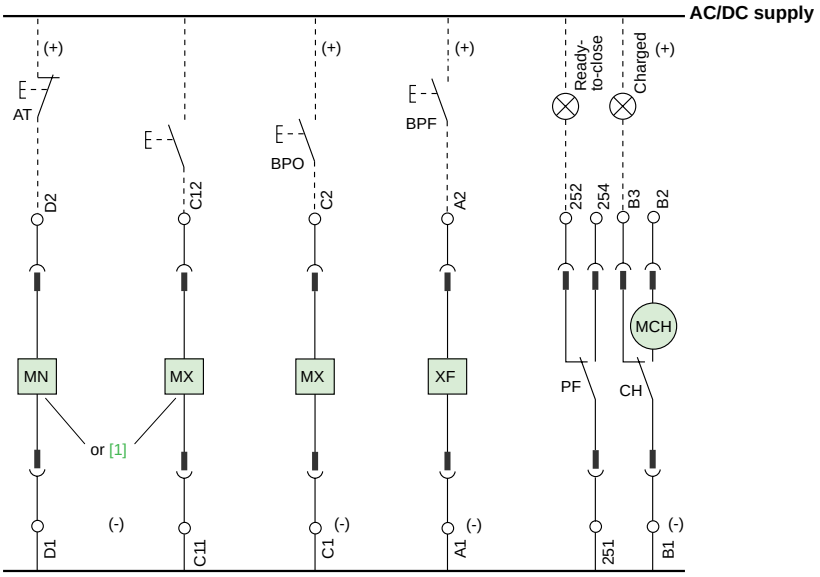
    NOTE: The diagnostic and communicating accessories require the installation of an isolation module.
- **Basic Coils** to open and close the device:
  - A shunt close (XF).
  - A shunt trip (MX).
  - A second shunt trip (MX2) or an undervoltage release (MN).
- **Spring Charging Motor (MCH)** to charge the spring.
- **Signalling Accessories** to enhance convenience:
  - Ready-to-close contact (PF)
  - Device ON/OFF indication (OF)
  - Overcurrent trip indication (SDE)
- **Other Options** to complete the solutions:
  - The electrical closing pushbutton (BPFE) requires the installation of a shunt close (XF diag&com).

Remote Control Solutions

Three remote control solutions are provided by MasterPacT MTZ devices.

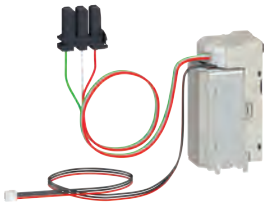
Wiring Basic Coils (XF, MX, MN)

MasterPacT MTZ circuit breakers can be opened and closed remotely by using the output contacts of a PLC or a pushbutton wired to the coils (MX, MN, XF). This solution requires hard wiring between the circuit breaker and the location from where the operation is conducted.



[1] It is possible to add a second voltage release (MX) or an undervoltage release (MN).

[2] The maximum lengths of the wiring between the AC/DC power supply and voltage release terminals A1-A2 / C1-C2 / C11-C12 / D1-D2 are given in Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Basic Coils, page 89.

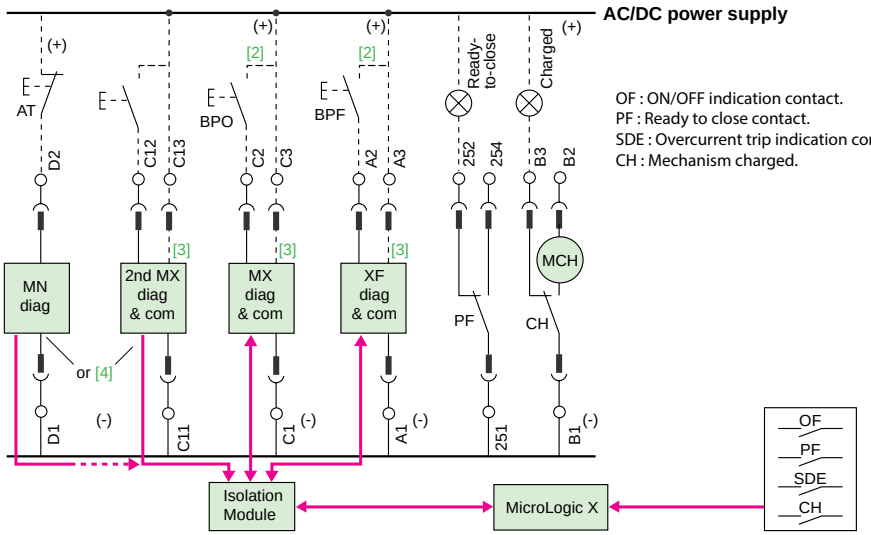


XF diag&com,
MX diag&com,
MN diag

Wiring Diagnostic and Communication Coils (XF diag&com, MX diag&com, MN diag)

When coils with diagnostic functions are used in customer wiring, the following diagnostic information is available in addition to remote operation. The information can be accessed through the MicroLogic X embedded HMI, wireless communication, and EcoStruxure Power Commission Software through a USB connection.

- Identify the type of the coil, MX diag&com, XF diag&com or MN diag.
- Detect if the coil is functioning properly by comparing the release order and the opening/closing status of the circuit breaker.
- Check if there is any breakage of the wiring in the coil periodically (every 30 seconds).
- Identify if the order comes from the electrical close push button (BPFE) option.
- Identify if the order is a permanent order.
- Count the operation cycle of the coils.



NOTE: When MX or XF diagnostic and communicating coils are used, the third wire (A3, C3, C13) must be connected. When the control voltage (A3-A1, C3-C1, C13-C11) is applied to the coils, wait 1.5 seconds before issuing an order. Pay special attention to control voltage when using these coils in applications where the power supply may disappear such as source changeover systems.

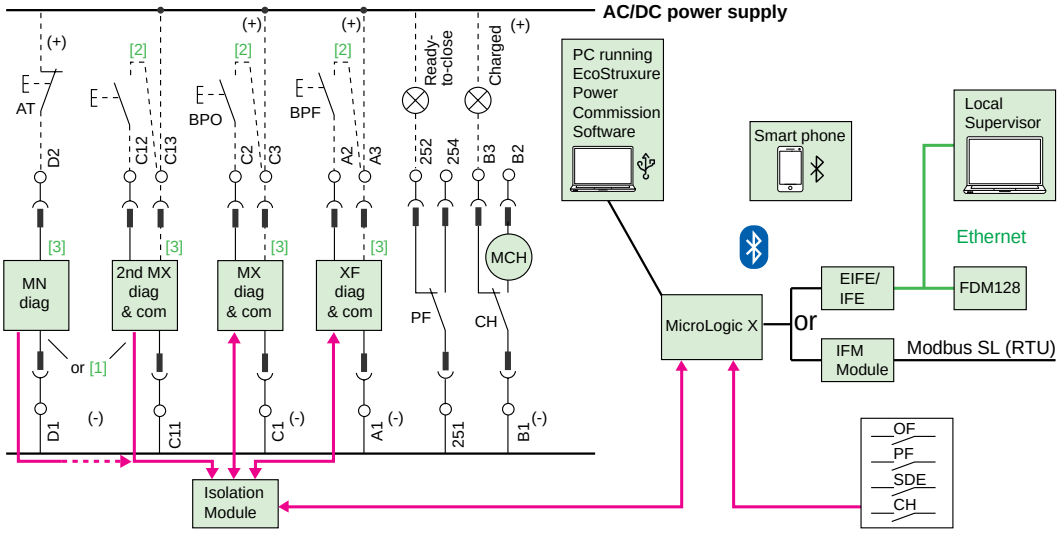
Communication Network Connection with Diagnostic and Communication Coils (XF diag&com, MX diag&com)

When a communication system is present, the MasterPacT MTZ device can be opened and closed from a remote control system such as a SCADA, through the communication network.

In addition to the functions of the previous solution, this solution brings the following benefits:

- The communication network provides location flexibility and can reduce wiring costs.
- Diagnostic information can be accessed remotely through the communication network but not from the MicroLogic X embedded HMI.

A communication network solution and point-to-point solution can be implemented together when using communication coils.



[1] It is possible to add a second MX diag&com voltage release or an MN diag undervoltage release.

[2] Maximum length of the two wires cables between A2-A3 / C2-C3 / C12-C13: 5 m (16 ft.).

[3] For the maximum lengths of the wiring between the AC/DC power supply and voltage release terminals A1-A3 / C1-C3 / C11-C13 /D1-D2 see Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Basic Coils, page 89.

Controlling the MasterPacT MTZ Circuit Breaker Open/Closed Status

The table below summarizes all the possibilities for controlling the Open/Closed status of a circuit breaker in different operating modes.

Controlling the Open/Closed Status in Different Operating Modes							
Connection	**Coils**	**Method**	**MicroLogic X Control Unit Operation Mode Setting**			**Limited to One Mode[47]**	**Diagnostic Information[48]**
			Manual	**Auto Local**	**Auto Remote**		
Customer wiring	Diagnostic & Communicating coils (XF diag&com, MX diag&com, MN diag)	Pushbutton	◉	◉	◉	—	◉
		BPFE coil connection	◉	◉	◉	—	◉
		Wireless pushbutton	◉	◉	◉	—	◉
		BPFE via MicroLogic X	◉	◉	◉	—	◉
		Digital input (IO module)	—	◉	◉ [49]	◉	◉
		EcoStruxure Power Commission Software via USB	—	◉	—	◉	◉
		MasterPacT MTZ mobile App (Bluetooth technology)	—	◉	—	◉	◉
	Basic coils (XF, MX, MN)	Pushbutton	◉	◉	◉	—	—
		Wireless pushbutton (XB5)	◉	◉	◉	—	—
Network solution with COM communication option	Diagnostic & Communicating coils (XF diag&com , MX diag&com)	BPFE via MicroLogic	—	◉	◉	—	◉
		Digital Input (IO module)	—	◉ [49]	◉	◉	◉
		EcoStruxure Power Commission Software via USB	—	◉	—	◉	◉
		SCADA via IFE/EIFE	—	—	◉	◉	◉
		FDM128 via IFE/EIFE	—	—	◉	◉	◉
		EcoStruxure Power Commission Software via IFE/EIFE	—	—	◉	◉	◉
		Webpage via IFE/EIFE	—	—	◉	◉	◉
		MasterPacT MTZ mobile App (Bluetooth technology)	—	◉	—	◉	◉

47. The operation can only be done in one operating mode. For example, when wiring with basic coils, Open/Closed operation of the circuit breaker using the pushbutton is not limited as it can be done in all three operating modes.
48. Details of diagnostic functions can be found in MicroLogic X Control Unit Diagnostics and Maintenance, page 34.
49. When the rotary switch of the IO module is switched to I2/I3, operation can only be done in Auto remote mode. When it is I4/I5, operation can only be done in auto local mode.

Selection of Coils

Three common cases illustrate the possible choice of coils.

Case I: Remote Opening

This solution enables the opening of the circuit breaker in case of an emergency.

Case II: Remote Opening and Closing

When both remote opening and closing is required then solution II must be considered, which also includes the motor operator to recharge the mechanism spring.

Case III: Remote Closing and Opening with Second MX or MN Coil

When redundancy of mechanisms is required in certain installations, a second MX/MX diag&com or MN/MN diag can be added.

The additional MN diag benefits the following situations.

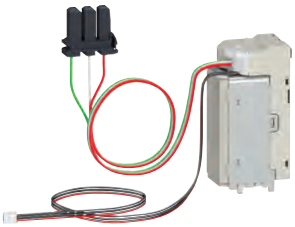
- When the voltage drops by 35 to 70% of its rated voltage, MN diag will open the circuit breaker automatically.
- When MX diag&com does not receive the order or does not open the circuit breaker after receiving the order, MN diag can be triggered to open the circuit breaker.

	Customer Wiring with Basic Coils	**Customer Wiring with Diagnostic & Communicating Coils**	**Communication Network Connection with Diagnostic & Communicating Coils**
User Case I: Remote Opening	**Option I:** • Shunt trip MX **Option II:** • Instantaneous undervoltage release MN	**Option I:** • Shunt trip MX diag&com **Option II:** • Instantaneous undervoltage release MN diag	**Option I:** • Shunt trip MX diag&com
User Case II: Remote Opening and Closing	**Option I:** • Shunt trip MX • Shunt close XF • Electrical motor MCH **Option II:** • Instantaneous undervoltage release MN • Shunt close XF • Electrical motor MCH	**Option I:** • Shunt trio MX diag&com • Shunt close XF diag&com • Electrical motor MCH **Option II:** • Instantaneous undervoltage release MN diag • Shunt close XF diag&com • Electrical motor MCH	**Option I:** • Shunt trip MX diag&com • Shunt close XF diag&com • Electrical motor MCH
User Case III: Remote Closing and Opening with 2nd MX or MN coil	Option I: • Shunt trip MX • Shunt close XF • Electrical motor MCH • Instantaneous undervoltage release MN	Option I: • Shunt trip MX diag&com • Shunt close XF diag&com • Electrical motor MCH • Instantaneous undervoltage release MN diag	Option I: • Shunt trip MX diag&com • Shunt close XF diag&com • Electrical motor MCH • Instantaneous undervoltage release

NOTE:

- An adjustable or non-adjustable delay unit can be added to MN and MN diag in all situations.
- An isolation module is required for all connections between MicroLogic X and diagnostic & communicating coils (XF diag&com, MX diag&com and MN diag).
- When a second MX diag&com or a MN diag coil is used, the diagnostic function only can be performed for these two coils. The communication function is not provided.

Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Diagnostic and Communicating Coils



These type of coils bring added functionality with diagnostic and communication capabilities:

- Identify the type of the coil, MX diag&com, XF diag&com or MN diag.
- Detect if the coil is functioning properly by comparing the device order and the opening/closing status of the circuit breaker.
- Check for wire breakage in the coil periodically (every 30 seconds).
- Identify if the order comes from the BPFE option.
- Identify if the order is a permanent order.
- Count the operating cycles of the coils.

Results can be read through all the different ways of retrieving information from the MicroLogic X control unit (see MicroLogic X Control Unit, page 17), including the embedded HMI, wireless communication, and EcoStruxure Power Commission Software through a USB connection. If the coils are connected to the communication system, they can also be accessed through the communication system.

Please refer to recommended wiring schematic and user guide for the diagnostic and communicating coils to avoid incorrect wiring and operation.

Communication Function

In addition to hard wiring, these coils can be connected to the communication network.

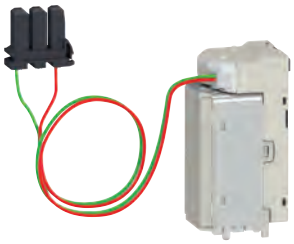
This allows the coils to be integrated in the communication system. Providing flexibility for remote operations, and the diagnostic function's results can be assessed remotely as well.

MN diag only has the diagnostic function. It cannot be connected to a communication network.

Continuous-Type Release Action

In addition to the diagnostic function, these devices feature a continuous-type release; the release can be maintained as long as the order is maintained. This feature allows the MX diag&com to lock the circuit breaker in the OFF position when the order is maintained.

Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Basic Coils



XF Shunt Close and MX Shunt Trip

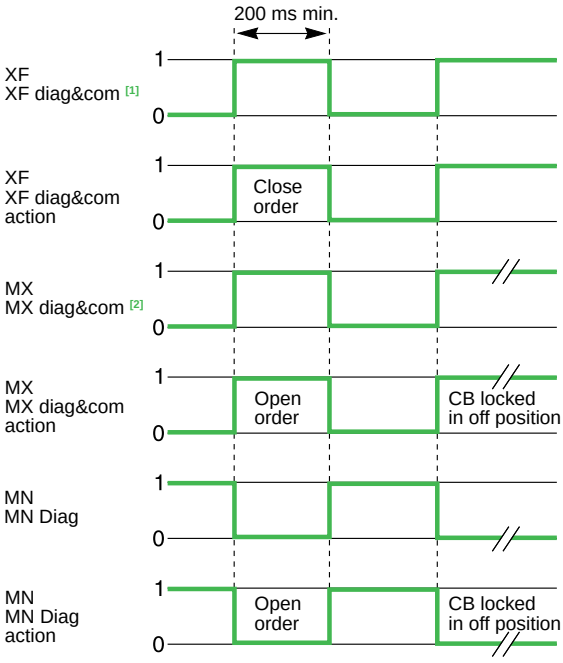
When signalled, the shunt close (XF) and shunt trip (MX) instantaneously triggers the mechanism to close/open the circuit breaker. The undervoltage trip (MN) also opens the circuit breaker when its supply voltage drops to a value between 35% and 70% of its rated voltage. Circuit breaker closing is possible only when the supply voltage of the undervoltage release returns to 85% of its rated value.

- MN undervoltage release locks the circuit breaker in the OFF position when it is not energized.
- MX opening voltage release can lock the circuit breaker in the OFF position if the order is maintained.

Coil Characteristics

The XF, MX, MN, XF diag&com, MX diag&com, and MN diag coils require a power supply separate from the MicroLogic X control unit power supply.

NOTE: The minimum duration of the pulse operating order must be 200 ms.



[1] For XF diag&com the supply shall be present between terminals A1-A3.

[2] For MX diag&com the supply shall be present between terminals C1-C3.

XF and MX Characteristics			
Characteristics		**XF, XF diag&com**	**MX, MX diag&com**
Power Supply	Vac 50/60 Hz	24 - 48 - 100/130 - 200/250 - 277 - 380/480	
	Vdc	12 - 24/30 - 48/60 - 100/130 - 200/250	
Operating Threshold		0.85 to 1.1 Vn	0.7 to 1.1 Vn
Consumption (VA or W)		Hold: 4.5	Hold: 4.5
		Pick-up: 200 (200 ms)	Pick-up: 200 (200 ms)
Circuit Breaker Response Time at Vn		MTZ1: 55 ms ±10	55 ms ±10
		MTZ2: 70 ms ±10	
		MTZ3: 80 ms ±10	

MN Characteristics		
Characteristics		**MN, MN diag**
Power Supply	Vac 50/60 Hz	24 - 48 - 100/130 - 200/250 - 380/480
	Vdc	24/30 - 48/60 - 100/130 - 200/250
Operating Threshold	Opening	0.35 to 0.7 Vn
	Closing	0.85 Vn
Consumption (VA or W)		Hold: 4.5
		Pick-up: 200 (200 ms)
MN Consumption with Delay Unit (VA or W)		Hold: 4.5
		Pick-up: 200 (200 ms)
Circuit Breaker Response Time at Vn		40 ms ±5 (MasterPacT MTZ1)
		90 ms ±5 (MasterPacT MTZ2, MTZ3)

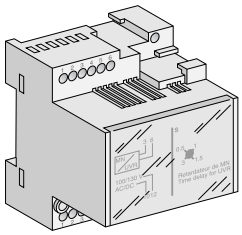
Recommended Maximum Cable Lengths							
		12 V		**24 V**		**48 V**	
		2.5 mm²	**1.5 mm²**	**2.5 mm²**	**1.5 mm²**	**2.5 mm²**	**1.5 mm²**
MN, MN diag	V source 100 %	—	—	58 m (190 ft.)	35 m (115 ft.)	280 m (920 ft.)	165 m (541 ft.)
	V source 85 %	—	—	16 m (52 ft.)	10 m (33 ft.)	75 m (246 ft.)	45 m 148 ft.)
MX-XF	V source 100 %	21 m (69 ft.)	12 m (29 ft.)	115 m (377 ft.)	70 m (230 ft.)	550 m (1804 ft.)	330 M (1083 ft.)
	V source 85 %	10 m (33 ft.)	6 m (20 ft.)	75 m (246 ft.)	44 m (144 ft.)	350 m (1148 ft.)	210 m (689 ft.)

NOTE: The indicated length are given for each of the two wires of the cables.

Undervoltage Release Delay (MN Delay Units)

To reduce circuit breaker nuisance tripping during short voltage drops, delay units can be installed to delay the undervoltage release (MN) and only trigger the release when voltage is low for a certain period of time. It can be disabled by an emergency OFF button to obtain instantaneous opening of the circuit breaker.

Two versions of the delay unit are available, adjustable and non-adjustable.



Adjustable or non-adjustable delay unit

MN Delay Units Characteristics		
Power supply Vac 50-60 Hz / Vdc	Non-adjustable	100/130 - 200/250
	Adjustable	48/60 - 100/130 - 200/250 - 380/480
Operating threshold	Opening	0.35 to 0.7 Vn
	Closing	0.85 Vn
Delay unit consumption	Pick-up: 200 (200 ms)	Hold: 4.5
Circuit breaker response time at Vn	Non-adjustable	0.25 s
	Adjustable	0.5 s - 1 s - 1.5 s - 3 s

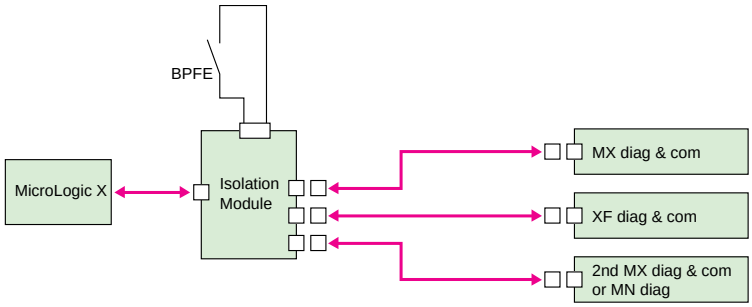
Isolation Module for Diagnostic and Communicating Coils

Isolation Module

The isolation module is required for XF diag&com and MX diag&com.

When diagnostic and communicating coils are required, the internal isolation module for MicroLogic X control unit is required to provide reinforced insulation as per IEC 60664-1 (up to 12 kV). It is installed between the coils and the MicroLogic X control unit. Besides the isolation between the electric network and the MicroLogic X control unit, it also provides the insulation between the coils. It is necessary because the coils can be powered by different voltages.

Electrical Closing Pushbutton (BPFE) with Diagnostic & Communicating Functions



NOTE:

- Only one isolation module is needed regardless of the number of voltage release installed. To make sure the isolation module is ordered for diagnostic and communicating voltage release, it will be added to the purchase list automatically when XF diag&com, MX diag&com or MN diag is selected.
- For safety reasons, do not use a 277-380/480 V voltage release with a 24/48 V voltage release in the same circuit breaker.
- When the BPFE is also ordered, the BPFE is connected in the factory to the isolation module.

Electrical Closing Pushbutton (BPFE)

Located on the front cover of the circuit breaker, this push button carries out electrical closing of the circuit breaker, taking into account the functions installed as part of the control/monitoring system of the installation.

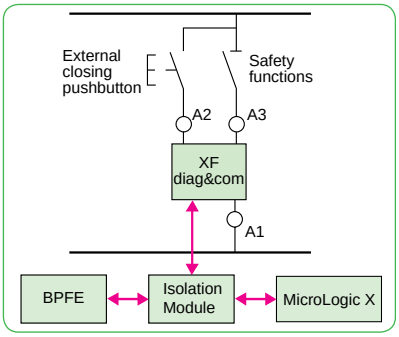
The Electrical Closing Pushbutton (BPFE) requires the XF Diag&Com shunt close to be installed on the circuit breaker.

The BPFE does not operate with a standard XF shunt close.

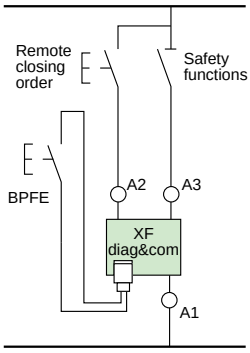
The standard solution is done in the factory. When the BPFE option is ordered, the circuit breaker will be delivered equipped with the BPFE and a XF diag&com shunt close, both connected on the isolation module. The two functions of the XF diag&com shunt close (remote control through MicroLogic X control unit and diagnostic) are operational.

Terminal A2 of the XF diag&com shunt close can be used to close the circuit breaker by means of an external closing pushbutton. Terminal A3 can be used to insert the safety functions of the installation

For personnel and equipment protection, the BPFE is generally associated with the pushbutton locking VBP that restricts access to the mechanical closing pushbutton.

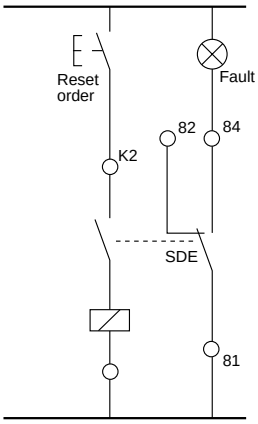


BPFE Standard Solution (factory installed)



BPFE with Diag&amp Communicating Function Not Used

Remote Reset After Overcurrent Trip

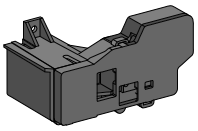


Remote Reset After Overcurrent Trip

When an overcurrent trip happens, the overcurrent trip indicator (SDE) indicates 'fault' and the blue reset button on the upper left of the circuit breaker cover pops up. To close the circuit breaker, the reset button needs to be pressed down.

To do a remote reset after an overcurrent trip, two solutions, RES and RAR, are provided.

Electrical Reset After Overcurrent Trip (RES)

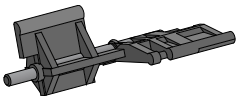


Electrical Reset After Overcurrent Trip (RES)

Use the electrical reset after overcurrent trip (RES) after tripping to reset the overcurrent trip switch (SDE) and the mechanical indicator (blue reset button located on the upper left of the circuit breaker cover). (Voltage rating: 110/130 Vac and 200/240 Vac.)

NOTE: The additional overcurrent trip indication contact (SDE2) is not compatible with RES.

Automatic Reset After Overcurrent Trip (RAR)



Automatic Reset After Overcurrent Trip (RAR)

The automatic reset after overcurrent trip (RAR) automatically resets the circuit breaker following tripping, pressing the button to reset the mechanical indicator is no longer required to enable circuit breaker closing (factory installed only).

NOTE: To achieve remote closing after overcurrent trip, the shunt close (XF) and spring charging motor (MCH) are required in addition to RES or RAR.

An opening order always takes priority over a closing order.

- If opening and closing orders occur simultaneously, the mechanism discharges without any movement of the main contacts. The circuit breaker remains in the open position (OFF).
- In the event of maintained opening and closing orders, the standard mechanism provides an anti-pumping function by blocking the main contacts in the open position.
- After overcurrent tripping or intentional opening of the circuit breaker, the closing order must be discontinued, then reactivated to close the circuit breaker.
- To avoid pumping after an overcurrent trip when the automatic reset after overcurrent trip (RAR) option is installed, the automatic control system takes into account the type of trip before issuing a new closing order or blocking the circuit breaker in the open position.

Spring Charging Motor (MCH)

The spring charging motor automatically charges the spring mechanism when the circuit breaker is closed. Instantaneous reclosing of the circuit breaker is thus possible following opening. The spring-mechanism charging handle can be used as a backup if the auxiliary power supply is absent.

The spring charging motor (MCH) is equipped as standard with a limit switch contact that signals the charged position of the mechanism.

The spring charging motor (MCH) requires a power supply separate from the MicroLogic X control unit power supply.

Spring Charging (MCH) for MasterPacT MTZ1 Devices

Spring Charging Motor (MCH) for MasterPacT MTZ2 and MTZ3 Devices

Characteristics		
Power Supply	**Vac 50/60 Hz**	**48/60 - 100/130 - 200/240 - 277- 380/415 - 400/440 - 480**
	Vdc	**24/30 - 48/60 - 100/125 - 200/250**
Operating Threshold		0.85 to 1.1 Un
Consumption	VA or W	180
Motor Overcurrent		2 to 3 In for 0.1 s
Charging Time		Maximum 3 s for MasterPacT MTZ1
		Maximum 4 s for MasterPacT MTZ2, MTZ3
Operating Frequency		Maximum 3 cycles per minute
CH Contact		10 A at 240 V

Remote Racking Device

The remote racking device allows the operator to perform circuit breaker racking operations from a distance of up to 9.1 m (30 ft.) away from the circuit breaker using the controller. This distance exceeds the arc flash boundary described in the arc flash safety guidelines outlined in NFPA 70E.

MasterPacT MTZ Protection Accessories

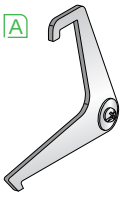
MasterPacT MTZ circuit breakers provide a high degree of safety to both people and property through the following features:

- Locking and interlocking
- Circuit protection
- Operation protection
- Mechanical protection

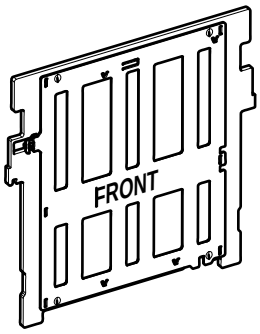
MasterPacT MTZ Locking and Interlocking Accessories

MasterPacT MTZ Locking and Interlocking Accessories Locations

A

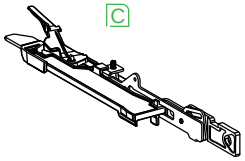


Door Interlock Catch (VPEC), page 101



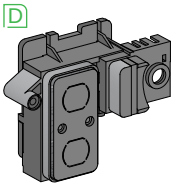
Safety shutters (VO)

C



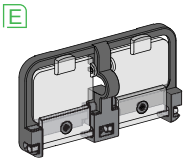
Shutter and Shutter Locking, page 100

D

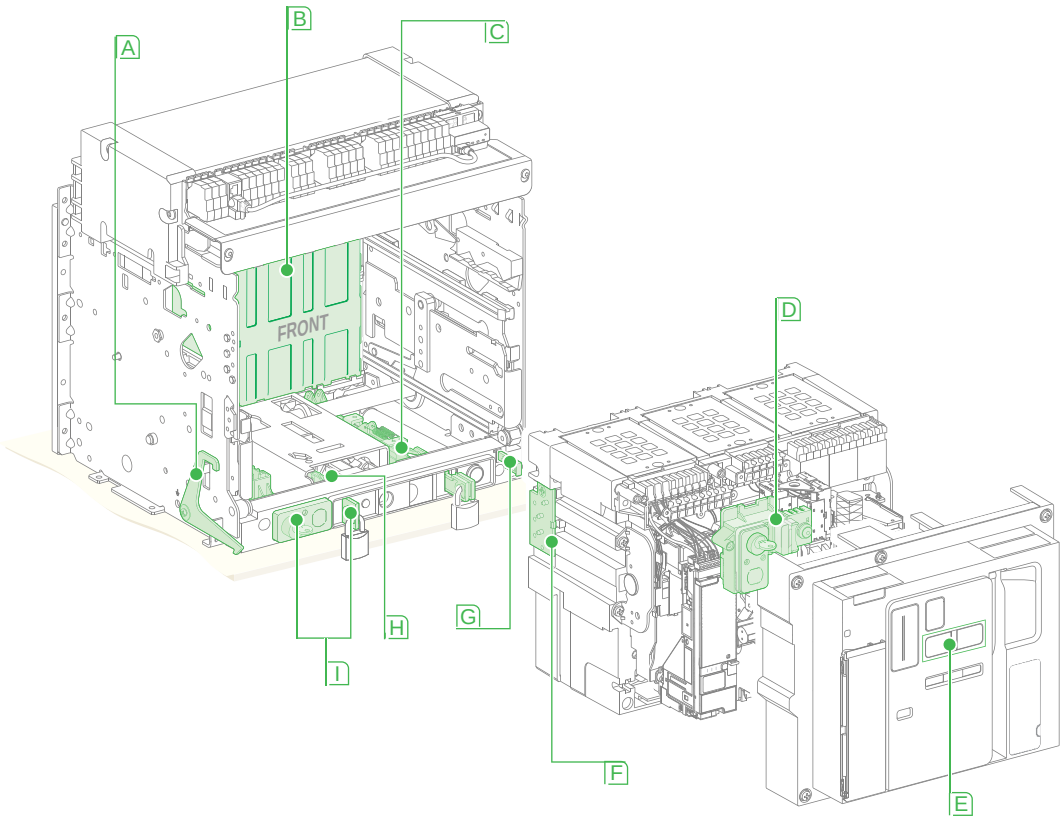


Device Locking in the OFF Position (VCPO and VSPO), page 99

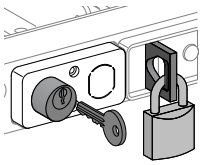
E



Pushbutton Locking (VBP), page 98

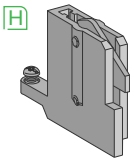


I



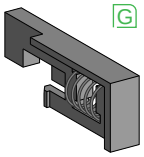
Device Locking in the Disconnected Position (VSPD), page 99

H



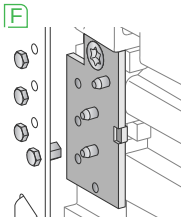
Interlock Between Racking Handle and Open Pushbutton (IBPO) (MTZ2, MTZ3 Only), page 101
Standard for UL/ANSI circuit breakers

G



Racking Interlock (VPOC), page 100

F



Cradle Rejection Kit, page 101

Pushbutton Locking (VBP)

Open and close pushbuttons can be blocked by using the lockable pushbutton cover (VBP). It consists of two transparent covers which can be locked with any of the following:

- Padlock (not supplied), 5 to 8 mm (0.2 to 0.3 in.)
- Wire seal
- Two screws

The opening button and the closing button can be locked independently.

Pushbutton locking (VBP) transparent covers to block access to pushbuttons.

Pushbutton locking (VBP) with padlock.

Device Locking in the OFF Position (VCPO and VSPO)

OFF Position Locking with Padlock (VCPO).

OFF Position Locking with Keylock (VSPO).

Two accessories are available for device locking in the OFF position:

- VCPO with padlocks
- VSPO with keylocks

The circuit breaker can be locked in the OFF position by physically maintaining pressing down on the opening pushbuttonn:

- Using padlocks (one to three padlocks, not supplied), shackle diameter 5–8 mm (3/16–5/16 in.)
- Using keylocks (one or two different keylocks, supplied).

Keys may be removed only when locking is effective (Profalux or Ronis type locks).

The keylocks are available in any of the following configurations:

- One keylock.
- One keylock mounted on the device + one identical keylock supplied separately for interlocking with another device.
- Two different keylocks for double locking.

Profalux and Ronis keylocks are compatible with each other.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk™ or Castell).

Accessory Compatibility

For MasterPacT MTZ1: 3 padlocks or 1 keylock.

For MasterPacT MTZ2, MTZ3: 3 padlocks and/or 2 keylocks.

For MTZ1, either keylock or padlock can be used.
For MTZ2 and MTZ3, padlock will always be available when the keylock is selected.
Padlock and keylock can be used at the same time.

Device Locking in the Disconnected Position (VSPD)

Disconnected Position Locking with Padlocks.

Located on the device cradle, this option provides a means to lock the circuit breaker in the disconnected position.

- Using padlocks (standard), up to three padlocks (not supplied).
- Using keylocks (VSPD option), one or two different keylocks are available.

Another way to lock the circuit breaker in the disconnected position is to use the locks on the cradle. It is feasible only when the door is closed.

Profalux and Ronis keylocks are available with:

- One keylock.
- Two different keylocks for double locking.
- One (or two) keylocks mounted on the device + one (or two) identical keylocks supplied separately for interlocking with another device.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell).

Cradle Locking in Connected, Disconnected, and Test Position

Disconnected Position Locking by Keylocks (VSPD)

The circuit breaker can be locked in the disconnected position by key interlock (optional) or padlock (standard).

The key interlock is on the cradle and is accessible with the door locked.

- Kirk key interlocks are available for UL/ANSI and IEC circuit breakers.
- Ronis, Castell, or Profalux key locks are also available.
- The key is captive when the key interlock is unlocked.
- Locking on disconnected, test, and connected positions is optional for IEC circuit breakers and standard for UL/ANSI circuit breakers.

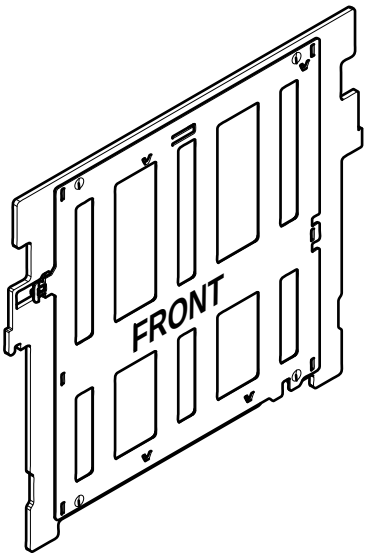
Shutter and Shutter Locking

The shutters automatically block access to the main disconnects when the circuit breaker is in the disconnected, test, or fully withdrawn position.

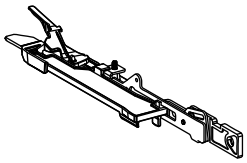
Shutter locking can be used to lock the shutters and not allow the circuit breaker to be racked in from the disconnected position.

The shutter lock is installed on the cradle front plate and allows the locking operation to be done outside of the cradle compartment. One to three padlocks can be used. (Padlocks are not supplied.)

NOTE: This option is applicable for MTZ2 and MTZ3 only.



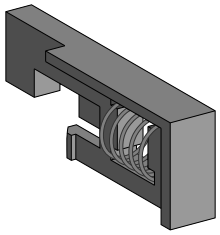
Shutter



Shutter Lock

Racking Interlock (VPOC)

This device prevents insertion of the racking handle when the cubicle door is open.



Racking Interlock (VPOC)

Door Interlock Catch (VPEC)

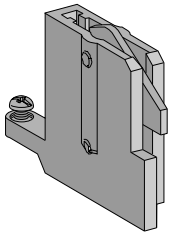
Mounted on the right or left-hand side of the cradle, this device inhibits opening of the cubicle door when the circuit breaker is in the connected or test position.

If the circuit breaker is put in the connected position with the door open, the door may be closed without having to disconnect the circuit breaker.

Door Interlock Catch (VPEC)

Interlock Between Racking Handle and Open Pushbutton (IBPO) (MTZ2, MTZ3 Only)

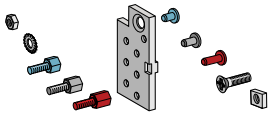
The racking interlock is standard for UL and ANSI circuit breakers, and optional for IEC circuit breakers. It does not allow insertion of the racking handle unless the Push to Open button is pressed.



Racking Interlock

Cradle Rejection Kit

The cradle rejection feature (standard) pairs the properly designated circuit breaker or switch with the appropriate cradle assembly.



Cradle Rejection Kit

MasterPacT MTZ Circuit Protection Accessories

External Sensor for Neutral and Ground-Fault Protection (ENCT)

External Sensor for Neutral Ground-Fault Protection (TCE)

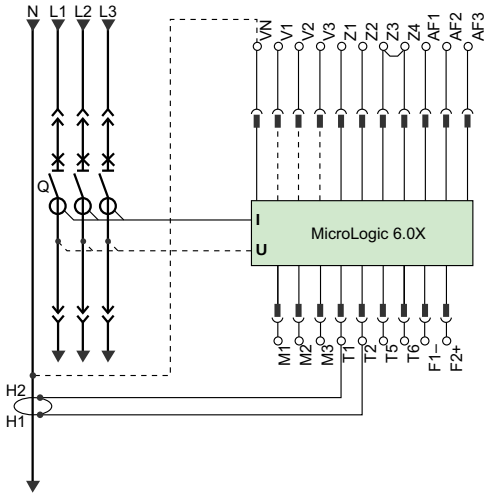
Installed on the neutral conductor, the external sensor enables the circuit breaker to perform:

- Neutral protection for three pole devices only.
- Neutral current measurement.
- Ground-fault protection for three-pole circuit breakers on 4-wire systems.

For MTZ1 or MTZ2, a single sensor with a single wire is provided.

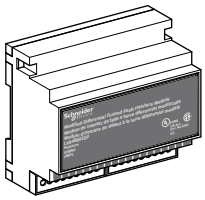
For MTZ3 both single sensor with single wire and double sensor with double wires are available.

For oversized neutral protection the sensor rating must be compatible with the measurement range: 1.6 x In (available up to MTZ2 40 for MTZ2 and MTZ1 16 for MTZ1)



External Sensor for Source-Ground Return Protection (SGR)

External Sensor for Source Ground-Return Protection



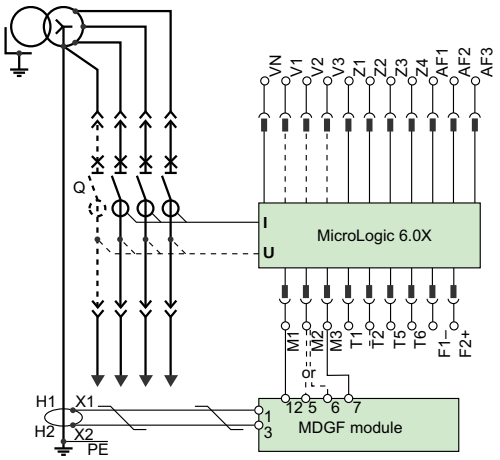
MDGF

The sensor is installed around the connection of the transformer neutral point to ground and connected to the MicroLogic 6.0 X control unit via a Modified Differential Ground-Fault (MDGF) module to provide the source ground-return (SGR) protection (see NHA92405).

Connection of the Secondary Circuit

Requires MasterPacT devices equipped with a MicroLogic 6.0 X control unit:

- Between the external transformer and the MDGF module:
  - unshielded cable with 1 twisted pair
  - maximum length 150 meters
  - cable cross-sectional area 0.4 to 1.5 mm² (21 to 16 AWG)
  - recommended cable: Belden™ 9409 or equivalent
- Between the MDGF module and the MicroLogic 6.0 X control unit:
  - unshielded cable
  - maximum length 10 meters
  - cable cross-sectional area 0.8 to 2.5 mm² (18 to 14 AWG)
  - recommended cable: Belden 9409 or equivalent
  - terminals 5 and 6 may not be used at the same time:
    - use terminal 5 for MTZ2 08 to 40
    - use terminal 6 for MTZ3 40 to 63

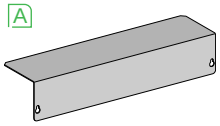


MasterPacT MTZ Operation and Mechanical Protection Accessories

External operating protection accessories are available to provide added safety when physical manipulation of the MTZ MasterPacT device is required.

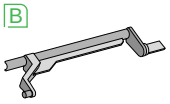
MasterPacT MTZ Operation and Mechanical Protection Accessories Locations

A



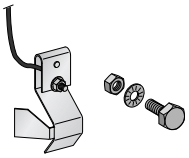
Terminal Cover (CB), page 105

B

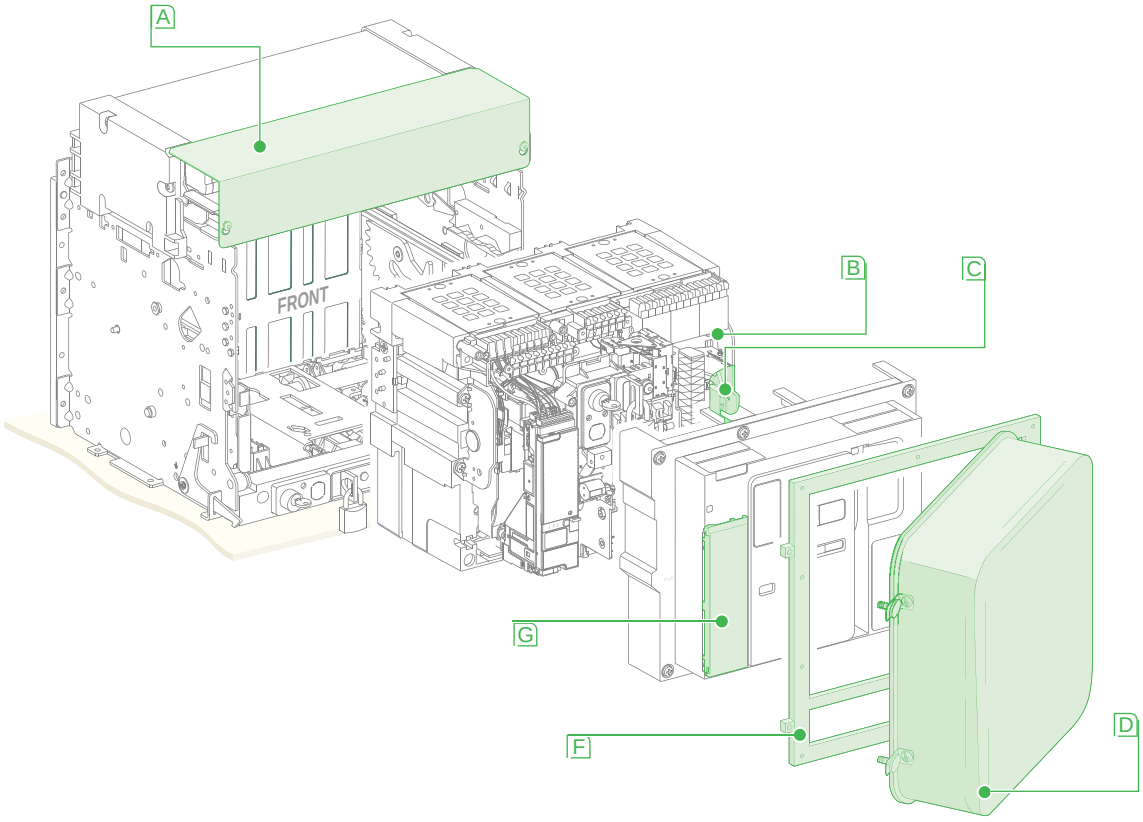


Automatic Spring Discharge Before Circuit Breaker Removal (DAE) , page 105

C



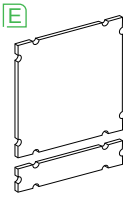
Grounding Kit (KMT), page 105



D

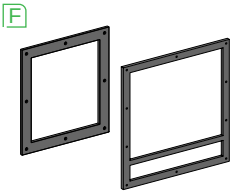
Transparent Cover for Escutcheon (CCP), page 105

E



Blanking Plate for Escutcheon (OP), page 106

F



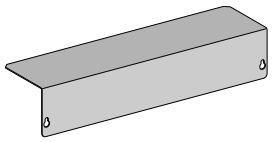
Door Cut-Out and Escutcheon (CDP), page 106

G

Transparent Cover for MicroLogic X Control Unit

Terminal Cover (CB)

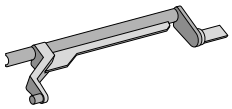
The optional terminal cover limits access to the electrical auxiliaries terminal blocks.



Terminal Cover (CB)

Automatic Spring Discharge Before Circuit Breaker Removal (DAE)

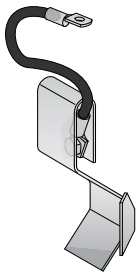
The Automatic Spring Discharge (DAE) automatically discharges the spring before the circuit breaker is removed from the cradle. It comes as standard on MTZ1, MTZ2, and MTZ3 circuit breakers.



Automatic Spring Discharge for MTZ2/MTZ3 (DAE)

Grounding Kit (KMT)

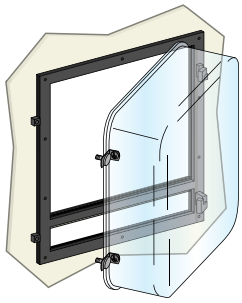
This option allows the grounding of the circuit breaker mechanism while the front cover is removed. The grounding is made using the cradle for the drawout version and the fixation side plate for the fixed version.



Grounding Kit (KMT)

Transparent Cover for Escutcheon (CCP)

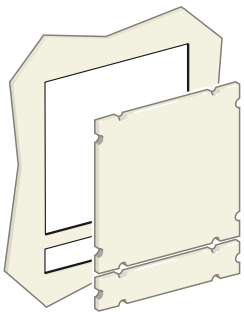
The cover is hinged-mounted, locked with milled head screws, and is designed to be installed on the door escutcheon. It is only suitable for installation with drawout devices.



Transparent Cover for Escutcheon. (CCP)

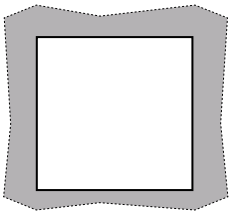
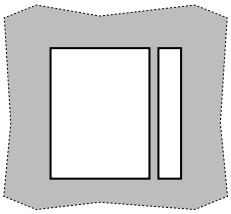
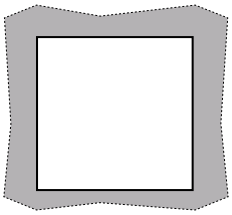
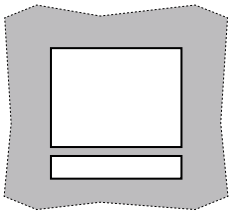
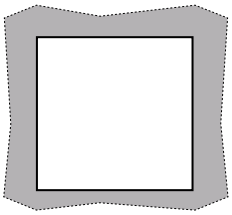
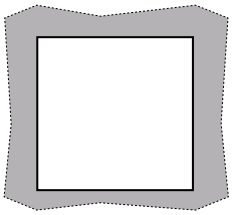
Blanking Plate for Escutcheon (OP)

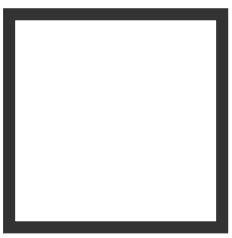
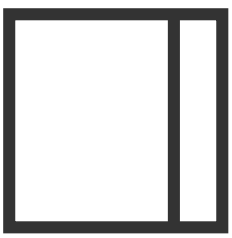
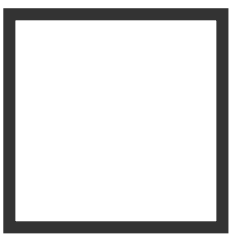
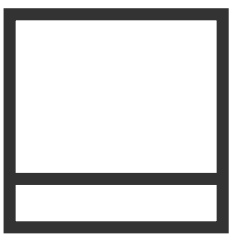
Used with the escutcheon, this option closes off the door cut-out of a cubicle not yet equipped with a device. It may be used with the escutcheon for both fixed and drawout devices.



Blanking Plate for Escutcheon (OP)

Door Cut-Out and Escutcheon (CDP)

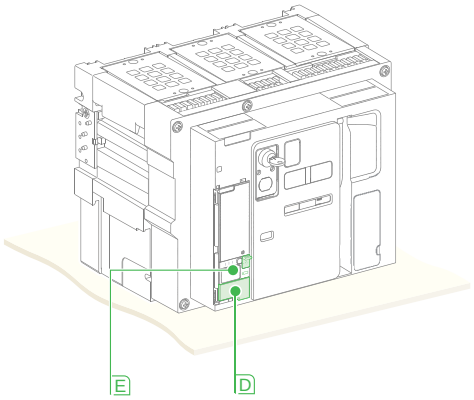
Door Cutout			
MTZ1		MTZ2/MTZ3	
Fixed	Drawout	Fixed	Drawout
 With or without escutcheon	 Without escutcheon	 With or without escutcheon	 Without escutcheon
	 With escutcheon		 With escutcheon

Escutcheon			
MTZ1		MTZ2/MTZ3	
Fixed	Drawout	Fixed	Drawout
			

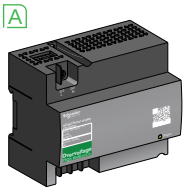
MasterPacT MTZ Power Supply Accessories

Power availability and reliability is crucial in all situations. These accessories provide different ways of powering up MicroLogic X control units.

MasterPacT MTZ Power Supply Accessories Location



A



24 Vdc Power Supply Module (AD), page 109

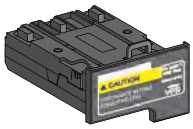
B

MicroLogic X Control Unit Mobile Power Pack, page 110

C

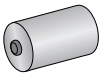
24 Vdc Universal Phaseo ABL8 Power Supplies, page 111

D



Voltage Power Supply Module (VPS), page 112

E



MicroLogic X Control Unit Spare Internal Battery, page 112

MicroLogic X Control Unit Power Supplies

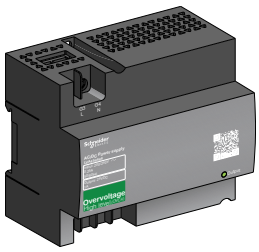
- The basic functions of protection performed by the MicroLogic X control unit (LSIG: long-time overload protection, short-time short-circuit protection, instantaneous short-circuit protection, ground-fault protection) do not require an external power supply.
  They are self-powered by the currents delivered by the current transformers embedded in the MTZ circuit breaker.
- When the circuit breaker load current is above 20% of the rated current all the functions processed by the MicroLogic X control unit operate correctly. This includes:
  - The functions of protection.
  - All the measures with the accuracies specified (see MicroLogic X Control Unit Measurement Values, page 32.
  - The diagnostic functions.
  - The embedded display and key pad (HMI).
  - The wireless communication features Bluetooth and proprietary connectivity).
- When the circuit breaker load current falls below 20% of the rated current, the VPS module or an external 24 Vdc power supply is needed for operation of MicroLogic X control unit with its specified performances.
- The external 24 Vdc is compulsory for the following devices associated to the MicroLogic X control unit:
  - The EIFE module.
  - The IFE module.
  - The IFM module.
  - The IO module.
  - The M2C programmable contact.
  - The ESM - ERMS switch module.
  - The FDM128.
  - The optional protections provided by the optional digital modules.

Two types of 24 Vdc power supplies are available for the MicroLogic X and its associated modules:

- The 24 Vdc power supply module (AD).
- The 24 Vdc Universal Phaseo™ ABL8 RPS 24050 and ABL8 RPS 24030 power supplies.

In addition, a portable Power Pack battery can be used to supply the MicroLogic X control unit through its mini USB port.

24 Vdc Power Supply Module (AD)



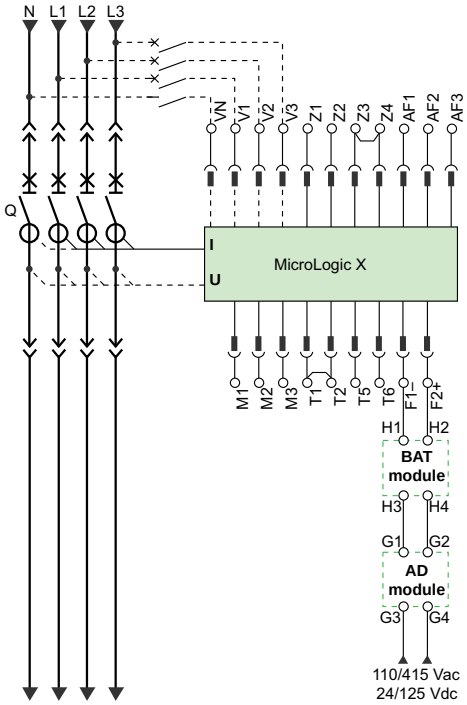
External 24 Vdc Power Supply Module (AD)

Characteristics

- Power supply AC: 110/130 Vac, 200/240 Vac, 380/415 Vac, 50/60 Hz; +10%, -15%.
- Power supply DC: 24/30 Vdc, 48/60 Vdc, 100/125 Vac; ±20%.
- Output voltage: 24 Vdc ±5%.
- Output current: 1 A.
- Ripple: < 1%.
- Dielectric withstand: 3.5 kV rms between input and output for one minute.
- Overvoltage category: as per IEC/EN 60947-1 Cat IV.
- Maximum operating temperature surrounding the power supply when installed inside electrical equipment: 60°C (140°F).

Connection

- The maximum length for each conductor supplying the power to the MicroLogic X control unit module is 10 m (32.8 ft.).
- The positive terminal (F2+) on the MicroLogic X control unit must not be connected to ground.
- The negative terminal (F1-) on the MicroLogic X control unit must not be connected to ground.
- The output terminals (- and +) of the 24 Vdc power supply must not be grounded.
- Reduce electromagnetic interference:
  - The input and output wires of the 24 Vdc power supply must be physically separated as much as possible.
  - The 24 Vdc wires (output of the 24 Vdc power supply) shall be twisted together.
  - The 24 Vdc wires (output of the 24 Vdc power supply) must cross all power cables perpendicularly.
  - The power supply conductors must be cut to length. Do not loop excess conductor.



MicroLogic X Control Unit Mobile Power Pack

Mobile Power Pack for MicroLogic X Control Units

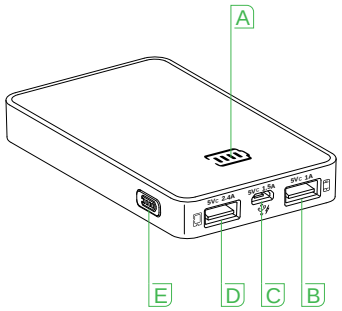
The mobile portable Power Pack battery is a manufactured & tested Schneider Electric device that energizes the MicroLogic X through the mini USB port. It allows the use of the embedded display to access basic settings and tripping information during shutdown.

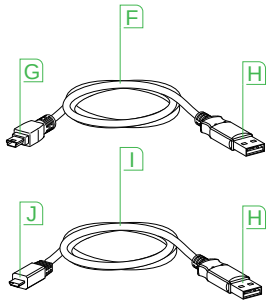
The Mobile Power Pack can be easily recharged by connecting it to a PC or a charger equipped with an USB port. The remaining power available in Power Pack can be read when pressing the power button for one second.

The Power Pack can also be used to charge a smartphone (an USB cable with a mini USB port is provided for this purpose).

This item can be ordered as a spare part.

Battery Indicators				
Battery Capacity Display				**State Explanation**
				100 %
				70 %
				40 %
				15 %
				< 15 %
				0 %
				Battery charging in progress
				Battery needs replaced





- A Battery capacity display
- B USB 5 V / 1 V output
- C Micro-USB 5 V / 1.5 A input
- D USB 5 V / 2.4 V output
- E Power button
- F Cable battery charging
- G Mini USB connector
- H USB connector
- I Cable for power MicroLogic X trip unit
- J Micro USB connector

24 Vdc Universal Phaseo ABL8 Power Supplies


ABL8 RPS Power Supply

- The Universal Phaseo ABL8 RPS 24050 and ABL8 RPS 24030 power supplies can be connected phase-to-neutral or phase-to-phase.
- They deliver a voltage that is precise to 3%, whatever the load and whatever the value of the AC supply, within the ranges 85 to 132 Vac and 170 to 550 Vac.
- To assist cooling there must be sufficient clearance around the Universal Phaseo power supplies:
  - 50 mm (1.97 in.) above and below.
  - 10 mm (0.04 in.) on the side.

ABL8RPS Module (AD) Characteristics			
Over Voltage Category per IEC/EN 60947-1		**Cat 2**	**Cat 4**
Input Supply Voltage AC		100–120 Vac and 200–500 Vac	110/130 or 200/240 or 380/415 Vac
Input Supply Voltage DC		N/A	24/30 or 48/60 or 100/125 Vdc
Limit Voltage		85–132 Vac and 170–550 Vac	—
Dielectric	Input/Output	4 kV rms -1 mn.	3,5 kV rms - 1 mn. (380 Vac model)
			3 kV rms - 1 mn. (110/130 Vac and 200/240 Vac model)
			3 kV rms - 1 mn. (110/125 Vdc model)
			2 kV rms - 1 mn. (24/30 Vdc and 48/60 Vdc model)
	Input/Ground	3 kV rms -1 mn.	
	Ouput/Ground	0,5 kV rms - 1 mn.	
Temperature		• 50°C • 60°C (at 80% rated current)	70°C
Output current		3 or 5 A	1 A
Ripple < 1%		200 mV peak-peak	240 mV peak-peak
Output voltage setting for line loss compensation		24 to 28.8 Vdc	N/A

NOTE: For the applications requiring an over voltage category higher than 2, a surge arrester shall be associated to ABL8RPS power supplies. The iPRD20r (reference: A9L16573) type 2 surge arrester is recommended.

Voltage Power Supply Module (VPS)

Voltage Power Supply Module (VPS)

When the current is below 20% of the rated current, the VPS module maintains the operation and performance of the MicroLogic X control unit.

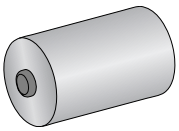
This includes:

- All the measures with the accuracies specified in MicroLogic X Control Unit Measurement Values, page 32.
- The HMI (embedded display and key pad).
- The wireless features (Bluetooth technology and proprietary connectivity).

The input voltage of the VPS module is limited to 600 V. Above 600 V it shall be supplied from an external voltage by means of the PTE option and voltage transformers. Presence of 24 V on VPS output is signaled by a green LED on the front face of the module. The VPS module can be easily installed in the bottom part of the MicroLogic X control unit. (For more information, see DOCA0102EN).

Power Supply Input		
Three phase	208–600 Vac +10/-30%	2.6 W
Two phase	208–600 Vac +10/-15%	1.7 W

MicroLogic X Control Unit Spare Internal Battery



Spare Internal Battery

The MicroLogic X control unit is equipped with an internal battery dedicated to the supply of the LED indicators and the internal clock. The battery can be replaced on site when discharged.

The battery is lithium type. Its service life is approximately ten years. A test button on the front of the control unit is used to check the battery condition.

This item can be ordered as a spare part.

MasterPacT MTZ Integration with Smart Systems

Ethernet-Ready Smart Systems

Ethernet-ready Smart Systems enable electrical distribution control and expertise. “Protect”, “Measure”, and “Connect” are the three pillars of this technology.

1. **Connect**
   Give a voice to the equipment.
   Secured Ethernet network data transmission is part of the design of protection and metering devices.
2. **Measure**
   Keep a close eye on energy flows.
   The electrical equipment captures building-related data, by gathering it from the critical protection and metering components.
3. **Protect**
   Electrical protection is at the core of Smart Systems.
   High-performance technology is built into every circuit breaker.
4. **Act**
   Future savings, peace-of-mind
   Access to Smart System status and values is essential for taking advantages of monitoring and management services, locally or remotely.

Future Savings and Peace-of-Mind

Access Smart System status and values to take advantages of monitoring and management services, locally or remotely.

Access large, non-critical buildings with EcoStruxure Building and with EcoStruxure Energy Expert.

Access Small/Medium Buildings with FDM128, Com’X™ 510, IFE, EcoStruxure Facility Expert

Day-to-Day Energy Management

Power availability, Power quality, Energy performance

For simply dealing with building user’s needs and energy constraints.

EcoStruxure Building Management provides electrical management, monitoring and energy accounting.

EcoStruxure Power Monitoring Expert (software for PC) collects Smart Systems values to provide expert analysis.

Access Large, Non-Critical Buildings with EcoStruxure Building and EcoStruxure Energy Expert

For dealing with building user's needs and energy constraints. EcoStruxure Building Management provides electrical management, monitoring and energy accounting.

Access Large, Critical Buildings with EcoStruxure Power Monitoring Expert

Energy decisions are often crucial in large critical buildings.

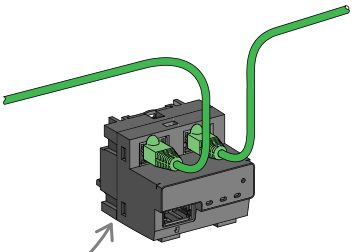
EcoStruxure Power Monitoring Expert PC software collects Smart System values to provide expert analysis.

http://pmedemo.biz/web/ ID: demo & Password: demo

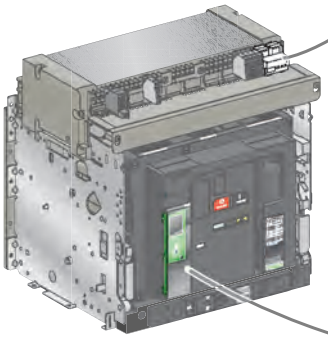
EcoStruxure Power Monitoring Expert

MicroLogic Control Unit and Enerlin'X™ Breaker Digital System

Smart Systems digitized by
Enerlin'X
Breaker Digital System



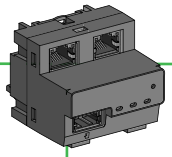
MasterPacT MTZ
Drawout Circuit Breaker

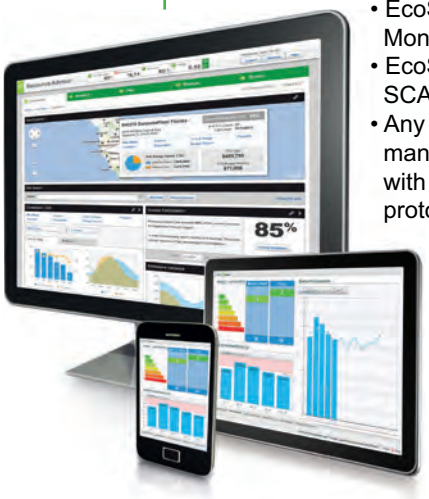


MasterPacT MTZ has an embedded Enerlin'X Ethernet (EIFE) module so it is ready to be connected to the Ethernet.

All your circuit breaker and energy data available via the Ethernet.

"IP connected" electrical equipment has become a key factor in the evolution in energy management and continuity of service.





- MasterPacT MTZ mobile App
- EcoStruxure Facility Expert
- EcoStruxure Facility Advisor
- EcoStruxure Power Monitoring Expert
- EcoStruxure Power SCADA Operation
- Any power management system with Modbus TCP protocol

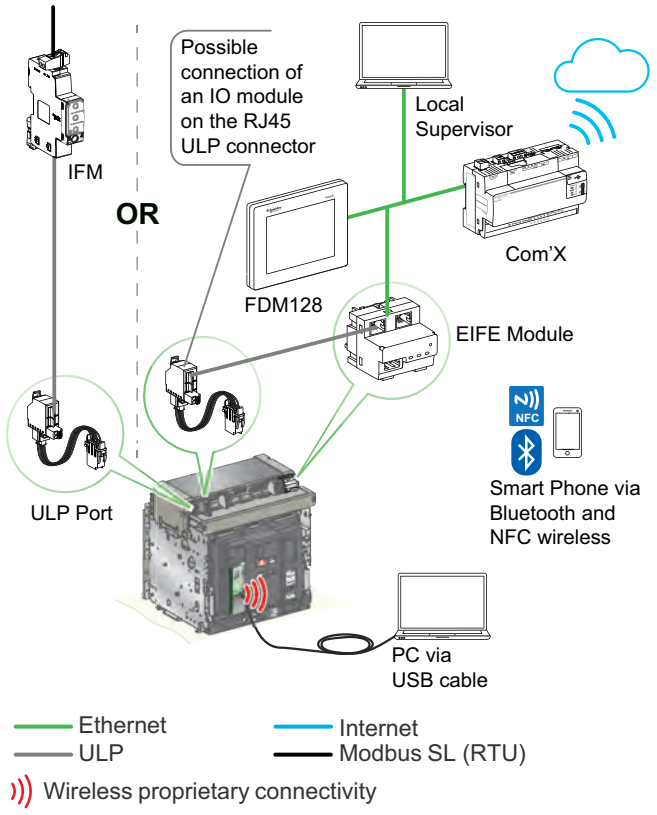
General Architecture

Ethernet has become the universal link between electrical equipment, computers and communicating devices inside buildings. The large amount of information which can be transferred makes the connection of the Enerlin'X Breaker Digital System to cloud-hosted and web-based services of Schneider Electric a reality.

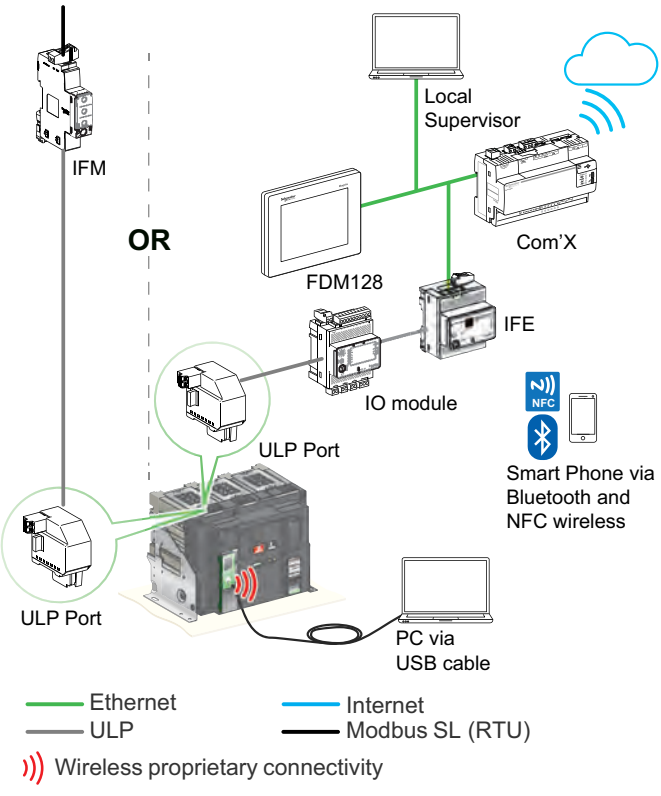
MicroLogic X control units and interfaces offers multiple communication channels:

- Connection to an Ethernet network through either an EIFE or an IFE interface module. The EIFE and IFE modules are connected to the MicroLogic X control unit by means of a ULP port and a prefabricated ULP cord. The EIFE is dedicated to drawout circuit breakers.
- Connection to a Modbus SL (RTU) RS 485 bus is through an IFM interface module. The IFM module is connected to the MicroLogic X control unit by means of a ULP port and a prefabricated ULP cord.
- Communication with a smartphone via a wireless powered Bluetooth channel or a self-powered NFC channel.
- Communication with a PC via a USB port.
- Connection to Internet-based servers or cloud platform. The connection to Internet can be performed through a Com'X module connected to internal Ethernet network. In addition MicroLogic X offers a wireless proprietary connectivity interface for communication with a Com'X module.

Drawout Circuit Breaker



Fixed Circuit Breaker



To improve the capabilities of monitoring and control, one or two IO modules connected to the ULP bus can be associated to IFE, EIFE, and IFM modules.

The EIFE is designed to monitor the three positions of the drawout circuit breaker when inserted in its cradle:

- Circuit breaker racked IN (CE contact).
- Circuit breaker racked OUT (CD contact).

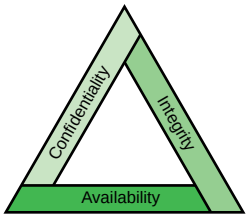
- Circuit breaker in test position (CT contact).
- No additional IO module is required to monitor these three positions.

The connection of an FDM128 display unit on the Ethernet internal bus is possible for any configuration.

The following control orders, information and data, are made available on Ethernet and Modbus SL (RTU):

- Control orders:
  - MX diag&com shunt trip opening order
  - XF diag&com shunt close closing order
- Events:
  - All the events logged in the MicroLogic X control unit event logbooks
- Status indications:
  - ON/OFF O/F
  - Spring charged CH
  - Ready to close
  - Overcurrent trip SDE
  - Connected / disconnected / test position CE/CD/CT
- Measurements
  - Instantaneous measurement information
  - Averaged measurement information
  - Max/Min values
  - Energy metering
  - Power quality...
- Operating assistance:
  - Protection settings and alarm
  - Histories
  - Maintenance indicators
- Availability:
  - Access control by password, to be initialized by the user

MicroLogic X Control Unit in Enerlin'X Digital Systems



Confidentiality

- Bluetooth Smart technology with wireless encrypted (AES-128) communication (IEEE 802.15.1).
- Proprietary connectivity with wireless encrypted (AES-128) internal communication (IEEE 802.15.4).
- NFC operates in very short range (a few centimeters).
- Pairing method and encryption is compliant with NIST 800-121.

Integrity

- Only Schneider Electric-signed firmware can be installed on the MicroLogic X control unit.
- Only Schneider Electric-signed digital modules can be installed on the MicroLogic X control unit.
- Only Schneider Electric-signed ULP modules can be installed on an IMU.

Availability

- Access control done by password. To be initialized by the user to change the default values.
- Restricted USB usage for communication profile only (no mass storage).

MicroLogic X control units can be incorporated in Enerlin'X digital system using EIFE and IFE interface modules. Enerlin'X provides a simple and reliable link to local LCD displays and expert applications over Ethernet.

It makes available on Ethernet most of the information collected in the circuit breakers and other electrical devices installed in a low voltage electrical equipment: Status, measurements, counters and alarms etc.

System Security

Operational security is important for electrical installations when it comes to local and remote interaction. Confidentiality, integrity and availability (also known as the AIC triangle) is a model designed to guide policies for information security within an organization and these elements are considered as the three crucial components of security.

In this context, confidentiality is provided by rules that limit access to information (equivalent to privacy), integrity means the information is trustworthy and accurate, and availability means there is access to the information by authorized people.

Bluetooth Smart Connectivity

MicroLogic X control units are equipped with Bluetooth 4.0 Smart wireless communication which allows a connection with a smartphone equipped with the same technology. Bluetooth Smart complies with the IEEE 802.15.1 standard.

NFC Connectivity

MicroLogic X control units are equipped with near field communication (NFC), which allows data exchange with a smartphone equipped with the same technology and follow the standard ISO/IEC 15693-3.

Proprietary Connectivity

MicroLogic X control unit are equipped with a proprietary connectivity means based on IEEE 802.15.4 standard which allows a connection with a Com'X module.

ULP Connectivity

ULP is a fast communication link dedicated to circuit breaker monitoring and control. It connects the circuit breaker to an Ethernet interface or an IO module. ULP operates at a speed of 1 Mb/s and is plug & play.

Ethernet Connectivity

Ethernet is a data link and physical layer protocol complying with the IEEE 802.3 standard. It operates at a speed of 10, 100 or 1000 Mbps. The maximum length of Ethernet cable between two devices is 100 m (328 ft.).

IFE and EIFE Ethernet interfaces can be connected to a PC, a laptop or a PLC over Ethernet.

The IFE Ethernet switchboard server provides a Modbus TCP/IP gateway over Ethernet to enable Modbus TCP communication from a Modbus TCP master to any Modbus slave devices connected to it. The maximum active Modbus TCP client connection is twelve.

IFE and EIFE Ethernet interfaces have an embedded web server (web page).

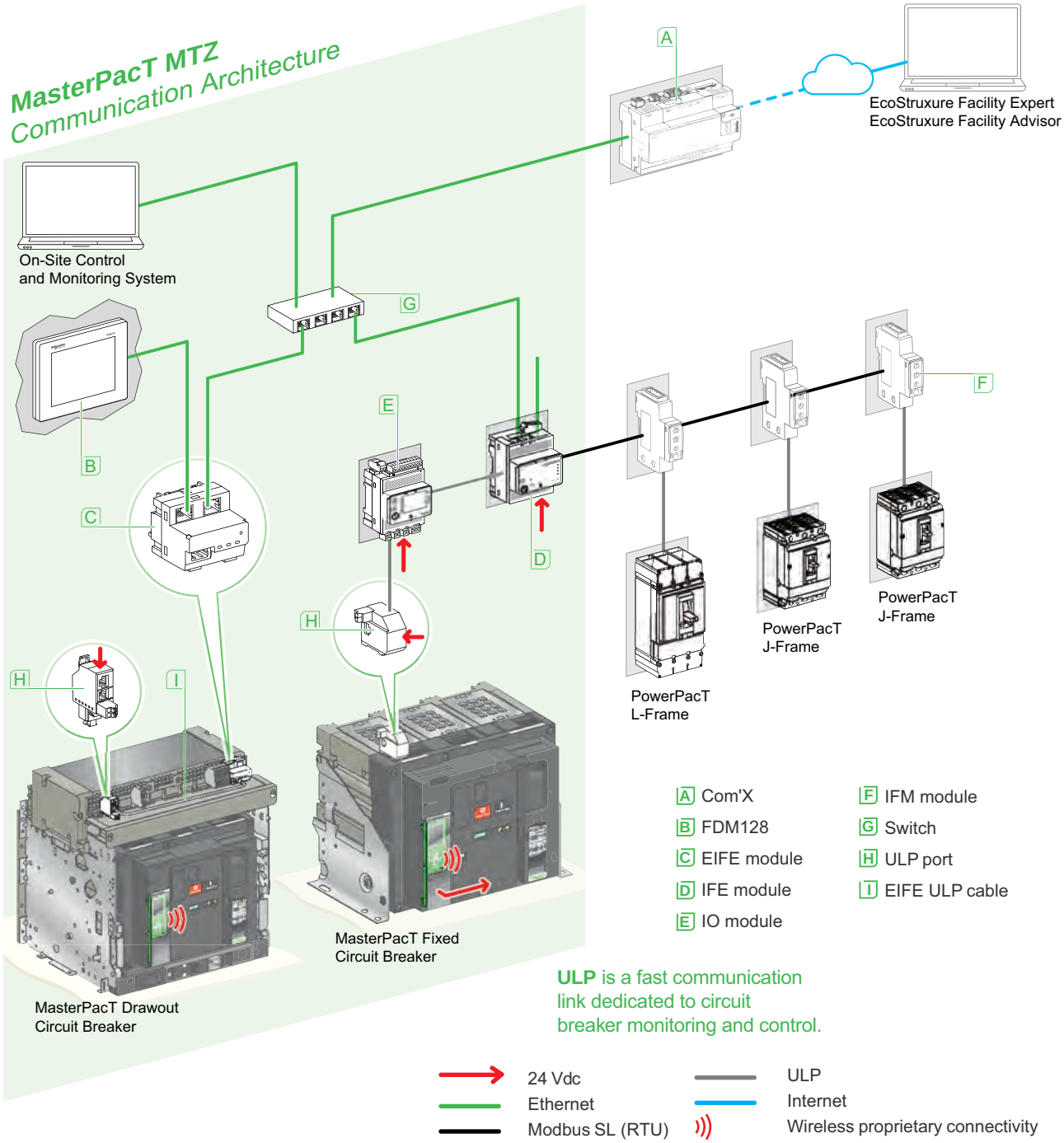
Modbus Connectivity

Modbus SL (RTU) is a communication protocol widely used in industrial networks. It operates according to a "primary-secondary" mode, where the secondary communicates one at a time with the primary. This is an RS 485 open bus on which communicating Modbus devices are connected. All types of PLCs and microcomputers may be connected on to the bus.

The maximum number of devices that may be connected to a bus depends on the type of devices, the baud rate (19200 is recommended), the volume of data exchanged, and the expected response time. The RS 485 physical layer offers up to 32 connection points on the bus (1 master, 31 slaves).

Maximum recommended length for Modbus SL (RTU) bus is 1200 m (3940 ft.).

Digitized Electrical Equipment Architecture Example



Note: For every MasterPacT MTZ the 24 Vdc supply of all the associated interface modules (ULP port, IFE, IFM, IO) must be delivered from the same 24 Vdc power supply.

Enerlin'X Digital Devices for Connection and Monitoring

Enerlin'X Digital Devices for MasterPacT MTZ Circuit Breaker Connection and Monitoring									
		Name	Function	Protocol		Bin. Input	Analog. Input	Bin. Output	Cat. No.
				To Device	To Server				
A		Com'X 210 24 Vdc supply)	Energy Data Logger with Ethernet Gateway Function[50]	Modbus SL (RTU) & TCP/IP	Web Services	6	2	—	EBX210
		Com'X 510	Ethernet Server with Ethernet Gateway Function[50]	Modbus SL (RTU) & TCP/IP	Web Services	6	2	—	EBX510
B		FDM128	Ethernet LCD color Touch Display	Modbus TCP/IP	—	—	—	—	LV434128
C		EIFE	Embedded Ethernet Interface[51]	ULP	Modbus TCP/IP	—	—	—	LV851001SP
D		IFE Switchboard Server	Ethernet Interface & Gateway[51]	ULP Modbus SL (RTU) & TCP/IP	Modbus TCP/IP	—	—	—	LV434002
		IFE Interface	Ethernet interface for circuit breakers	ULP	Modbus TCP/IP	—	—	—	LV434001
E		IO	Input/Output Application Module for Circuit Breaker	ULP	—	6	1	3	LV434063
F		IFM interface	Modbus interface for circuit breakers	ULP	Modbus SL (RTU)	—	—	—	LV434000

50. Gateway: transfers data from one network to another (ie.: Ethernet to Internet or Modbus serial link to Ethernet).
51. Interface: transfers data from a device to a network.(ie.: ULP to Ethernet).

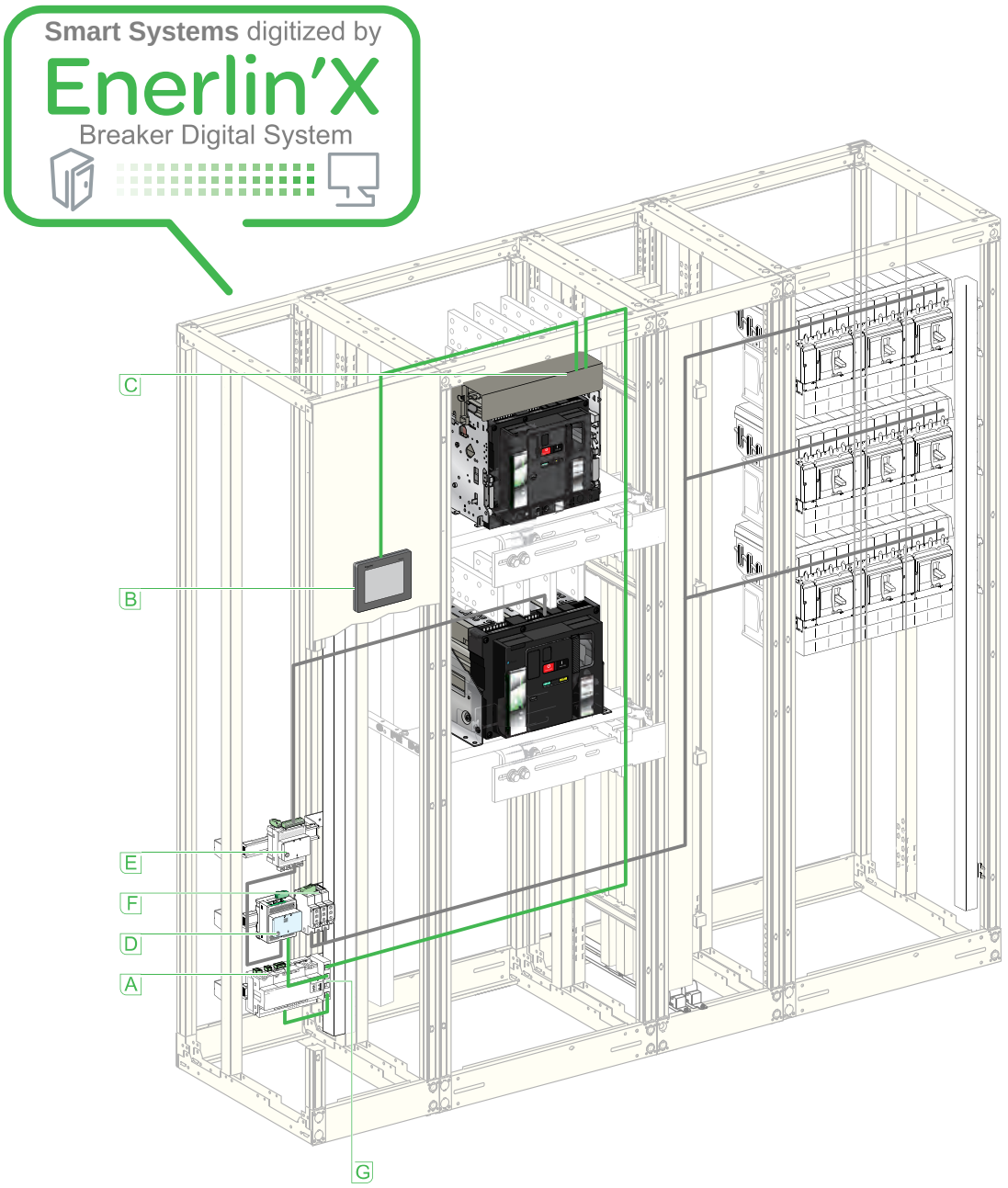
Enerlin'X Digital System Commissioning and Maintenance Tools

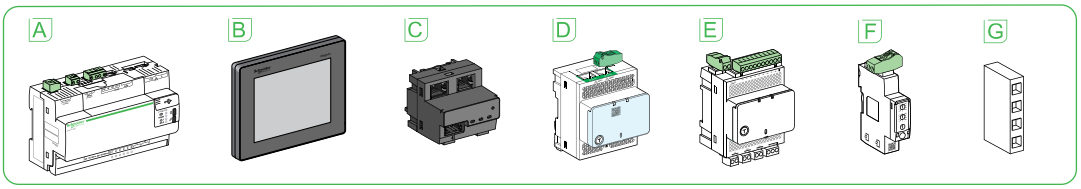
Plug and play commissioning tools provide added value to system builders as their panels can be functionally checked before delivery.

EcoStruxure Power Commission Software allows:

- Setting up and testing electrical equipment.
- Installing digital modules.
- Reduced commissioning time and sped-up factory acceptance tests (FAT) and site acceptance tests (SAT).
- Improved preventive maintenance work.

Smart System with Enerlin'X Digital Devices Example





Ethernet
Modbus SL
ULP

A Com'X
B FDM128
C EIFE module
D IFE module
E IO module
F IFM module
G Switch

ULP cable:
- 0.3 m (0.98 ft)
- 0.6 m (1.97 ft)
- 1 m (3.28 ft)
- 3 m (9.84 ft)
- 5 m (16.40 ft)

MasterPacT MTZ Communication Architecture

ULP Wiring system

The wiring system is designed for low-voltage power electrical equipment. Installation requires no tools or special skills.

The prefabricated wiring supports both data transmission and power supply for the communications modules associated with MicroLogic X control units.

ULP System

ULP system is a fast communication link dedicated to circuit breaker monitoring and control.

It is well adapted to severe environments.

A choice of cables with different lengths is provided for the connection of the ULP port to EIFE, IFE or IO modules.

EIFE / IFE Interfaces

EIFE / IFE interfaces provide an IP address to any circuit breaker fitted with an ULP port.

The EIFE / IFE interfaces make all available data from the circuit breaker accessible from an Ethernet compatible display (FDM128), a PC with common browser, or a Modbus TCP/IP client.

EIFE / IFE interfaces generate their own web pages.

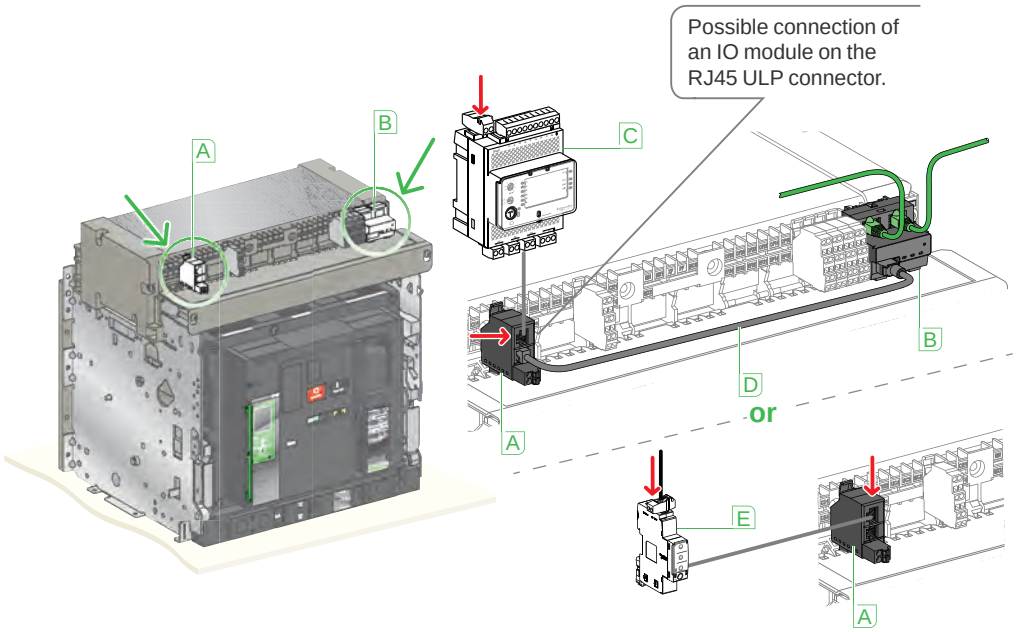
IO Application Module

The IO module is dedicated to circuit breakers with a ULP link.

It may maintain:

- Control of the circuit breaker.
- Control of applications around the circuit breaker such as the cooling system, load control, lighting, and pulse metering acquisition.

MTZ Drawout Circuit Breaker

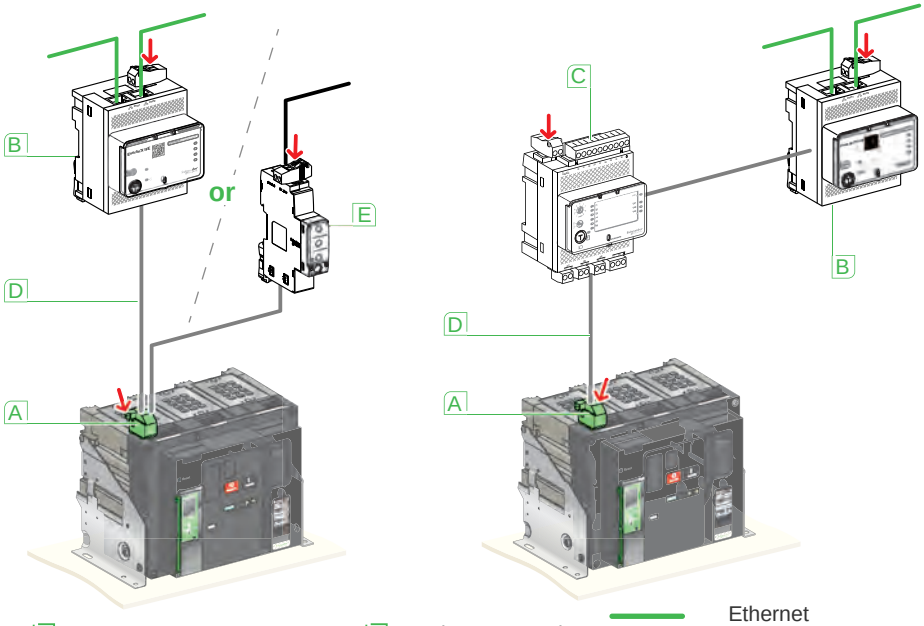


A ULP port
B EIFE communiation module
C IO module
D EIFE ULP cable
E IFM interface
Ethernet
ULP
24 Vdc
Modbus SL (RTU)

MTZ Fixed Circuit Breaker

MTZ Fixed Circuit Breaker Without IO Module

MTZ Fixed Circuit Breaker with Additional IO Module



A ULP port
B IFE communiation module
C IO module
D Breaker ULP cord
E IFM interface
Ethernet
ULP
24 Vdc
Modbus SL (RTU)

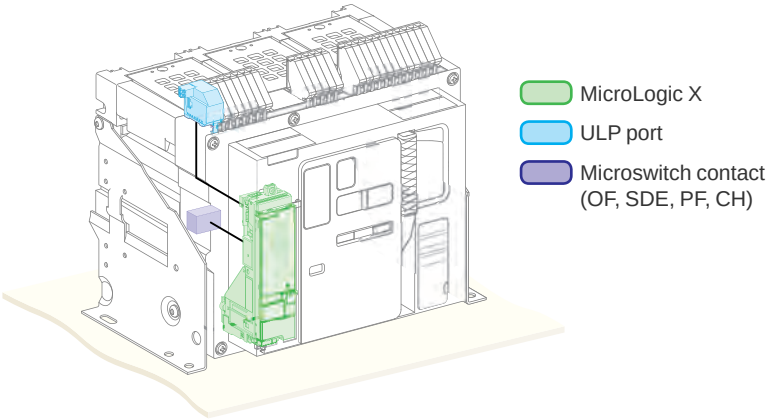
Note: For every MasterPacT MTZ circuit breaker the 24 Vdc supply of all the associated interface modules (ULP port, IFE, IFM, IO) must be delivered from the same 24 Vdc power supply.

Smart System Components

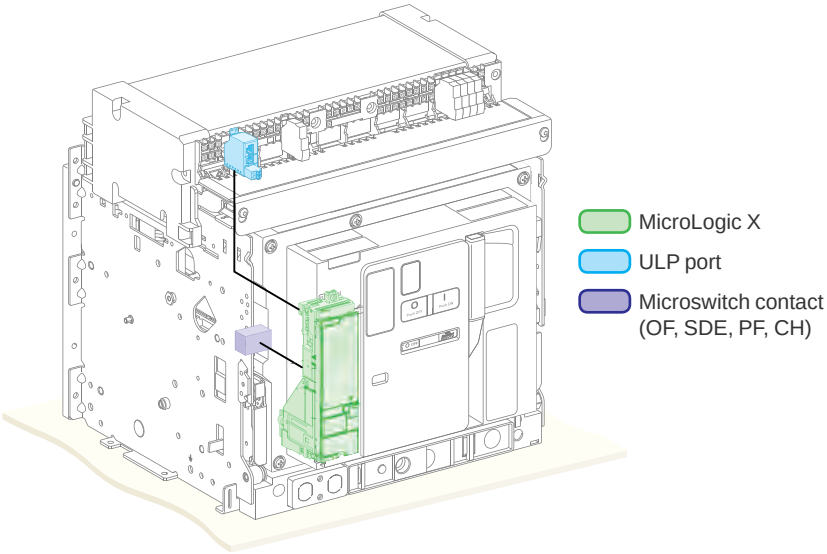
Smart System ULP Interface Module

In MasterPacT MTZ circuit breakers, an internal communication protocol (ULP port) is embedded in the MicroLogic X control unit (a BCM module is not needed), as well as the microswitch contacts necessary to obtain circuit breaker status information (OF, SDE, PF, CH).

MasterPacT MTZ Fixed Circuit Breaker



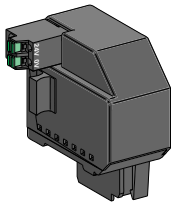
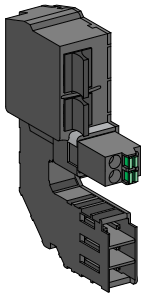
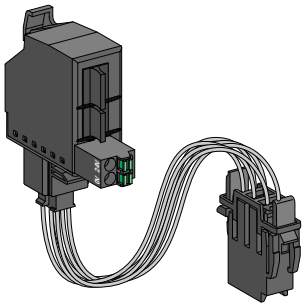
MasterPacT MTZ Drawout Circuit Breaker



NOTE: MasterPacT MTZ switches have no communication capabilities. They are not compatible with any communication architecture.

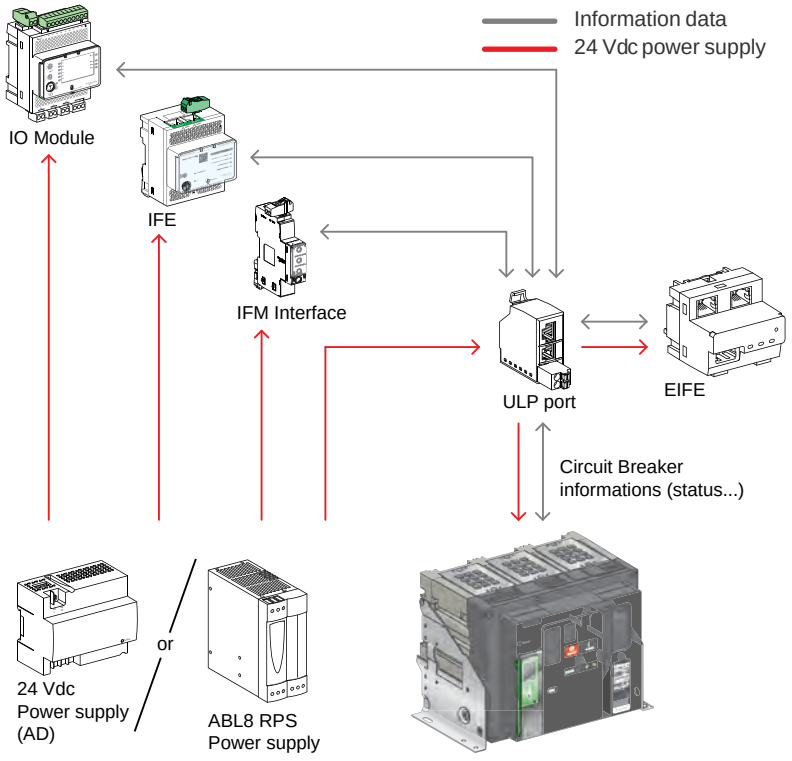
MasterPacT MTZ ULP Port

Depending on the type of the device (MasterPacT MTZ1, MTZ2, MTZ3, fixed or drawout version), the ULP port and its corresponding wiring kit is supplied as standard or as an option.

ULP Port Versions		
MTZ1/2/3Fixed	**MTZ1 Drawout**	**MTZ2/3 Drawout**
Optional	Optional	Standard
		

Use the ULP port and its corresponding wiring kit to:

- Interconnect the MicroLogic X control unit with EIFE, IFE and IO modules.
- Supply power to the control unit and the EIFE module.
- Integrate the ULP bus line termination.



Note:

- Possible connection of an IO module on the RJ45 ULP connector.
- When the ULP port is installed the 24 Vdc power supply shall be disconnected from the terminals F1/F2 of the control unit.
- The connection of the +/- of the power supply either on terminals F1/F2 of MicroLogic X control unit or on the +/- terminals of the ULP port must be strictly respected. Crossing the polarities may damage the device.
- For every MasterPacT MTZ circuit breaker the 24 Vdc supply of all the associated interface modules (ULP port, IFE, IFM, IO) must be delivered from the same 24 Vdc power supply.

Smart System EIFE Embedded Ethernet Interface

EIFE Embedded Ethernet Interface Description

EIFE Embedded Ethernet Interface

Introduction

The EIFE embedded Ethernet interface module enables drawout MasterPacT MTZ circuit breakers to be connected to an Ethernet network.

It provides digital access to the data delivered by the MasterPacT's MicroLogic X control unit. In addition it monitors the three positions of the circuit breaker when inserted in its cradle:

- Circuit breaker racked IN.
- Circuit breaker racked OUT.
- Circuit breaker in test position.

Provides an Ethernet access to a single drawout MasterPacT MTZ circuit breaker.

Function

One circuit breaker is connected to the EIFE interface via its ULP port.

EIFE Interface Features

- Dual 10/100 Mbps Ethernet port for simple daisy chain connection.
- Device profile web service for discovery of the EIFE interface on the LAN.
- Ethernet interface for drawout MasterPacT circuit breakers.
- Embedded set-up web pages.
- Embedded monitoring web pages.
- Embedded control web pages.
- Cradle status management (CE, CD, CT).
- Built-in e-mail alarm notification.
- RBAC (Role Base Access Control).

Mounting

The EIFE interface is mounted on the cradle of the drawout circuit breaker. There are two types of dedicated EIFE ULP cable, one for MasterPacT MTZ1 devices and one for MasterPacT MTZ2/MTZ3 devices.

24 Vdc Power Supply

The EIFE power supply is provided by the ULP port through the dedicated EIFE ULP cable.

EIFE Interface Firmware Update

The firmware can be updated using EcoStruxure Power Commission Software.

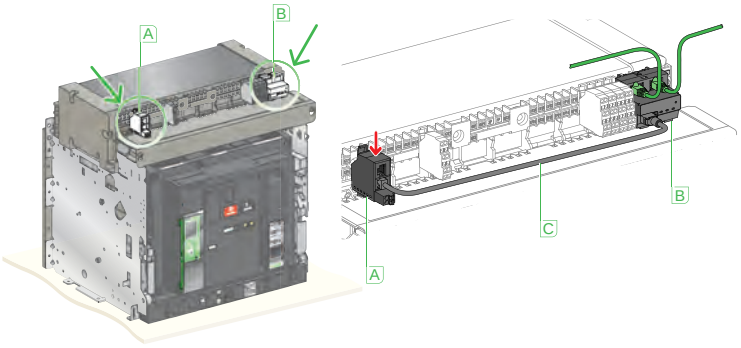
Required Circuit Breaker Communication Accessory

The connection to the EIFE interface requires an ULP communication port on the cradle of the drawout MasterPacT MTZ circuit breakers.

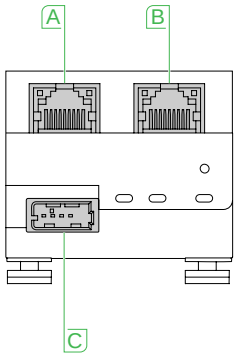
EIFE Mounting and Cabling

Ethernet
ULP
24 Vdc

A ULP circuit breaker port
B EIFE interface
C EIFE ULP cable



EIFE General Characteristics



A Ethernet port 1.
B Ethernet port 2.
C ULP port.

Environmental Characteristics		
Conforming to standards		IEC 60947-2, UL489, CSA C22.2 n°5
Certification		CE, EAC
Ambient temperature	storage	-40 to +85°C (-40 to +185°F)
	operation	-25 to +70°C (-13 to +158°F)
Relative humidity		5 - 85%
Level of pollution		Level 3
Protective treatment		ULV0 conforming to IEC/EN 60068-2-30
Mechanical Characteristics		
Shock resistance		As the EIFE is mounted on the circuit breaker it complies with its mechanical characteristics
Resistance to sinusoidal vibrations		
Electrical Characteristics		
Consumption		250 mA at 24 Vdc
Resistance to electrostatic discharge		• 8 kV air discharge • 6 kV contact discharge
Immunity to radiated fields		IEC/EN 61000-4-3: 20 V/m
Immunity to fast transient perturbations		IEC/EN 61000-4-4: 2 kV
Immunity to surges		IEC/EN 61000-4-5: 2 kV common mode
Immunity to conducted radio frequency field		IEC/EN 61000-4-6: 10 V
Physical Characteristics		
Dimensions		51 x 51 x 52.5 mm (2.07 in.)
Mounting		Circuit breaker DIN rail of MTZ1 & MTZ2/MTZ3
Weight		75 g (2.65 oz.) EIFE alone
Degree of protection of the installed module		• IP20 for connectors • IP30 for other areas
Connections		• RJ45 for Ethernet • Industrial USB connector for ULP

Smart System IFE Ethernet Interface

IFE Interface, IFE Switchboard Server Description

IFE Interface LV434001

IFE Switchboard Server LV434002

Introduction

The IFE interface and the IFE switchboard server enable LV circuit breakers to be connected to an Ethernet network.

- The IFE switchboard server incorporates a Modbus gateway.
- The IFE interface and IFE switchboard server are both equipped with two ULP ports and two Ethernet ports.
- The IFE switchboard server is equipped with a Modbus RS 485 serial connection.

MasterPacT or PowerPacT™ circuit breakers can be connected to an IFE interface and to an IFE switchboard server:

IFE Interface: ref. LV434001

Provides an Ethernet access to a single LV circuit breaker. The MasterPacT MTZ circuit breaker is connected to the IFE interface via its ULP port and a prefabricated ULP cord [52].

IFE Switchboard Server: ref. LV434002

Provides an Ethernet access to one or several LV circuit breakers. It allows to interface to Ethernet:

- One single circuit breaker connected to the IFE interface via its ULP port and a prefabricated ULP cord.
- Up to 12 PowerPacT circuit breakers connected through the modbus serial line interface.

Each PowerPacT device is connected to Modbus by means of a dedicated IFM interface module performing the ULP/Modbus conversion.

The connection between each PowerPacT device and its associated IFM interface is made using a prefabricated ULP cord connected to ULP ports.

IFE Interface, IFE Switchboard Server

- Dual 10/100 Mbps Ethernet port for simple daisy chain connection.
- Device profile web service for discovery of the IFE interface and IFE switchboard server on the LAN.
- ULP compliant for localization of the IFE interface in the electrical equipment.
- Ethernet interface for MasterPacT and PowerPacT circuit breakers.
- Gateway for Modbus-SL (RTU) connected devices (IFE switchboard server only).
- Embedded set-up web pages.
- Embedded monitoring web pages.
- Embedded control web pages.
- Built-in e-mail alarm notification.
- Internal real-time clock with battery back-up.
- RBAC (Role Base Access Control).

Mounting

The IFE interface and the IFE switchboard server are DIN rail mounted devices.

52. ULP total network length is temporarily limited to a maximum of 5 meters for the following devices combinations:
• MasterPacT MTZ fixed circuit breaker and IFE Interface
• MasterPacT MTZ fixed circuit breaker and IFE Interface and IO module
• MasterPacT MTZ fixed circuit breaker and IFE Interface and 2 x IO modules.
The limitation will be removed with a future release of IFE Interface module. Please contact your local Customer Care Center for more information.

A stacking accessory enables the user to connect several IFMs (ULP to Modbus serial line interfaces) to an IFE switchboard server without additional wiring.

24 Vdc power supply

Supply the IFE interface and the IFE switchboard with either a 24 Vdc AD or with a 24 Vdc ABL8 RPS power supply.

The IFMs stacked to an IFE switchboard server are supplied by the IFE, thus it is not necessary to supply them separately.

NOTE: The connection of the +/- of the power supply on +/- terminals of the IFE device must be strictly respected. Crossing the polarities may damage the device.

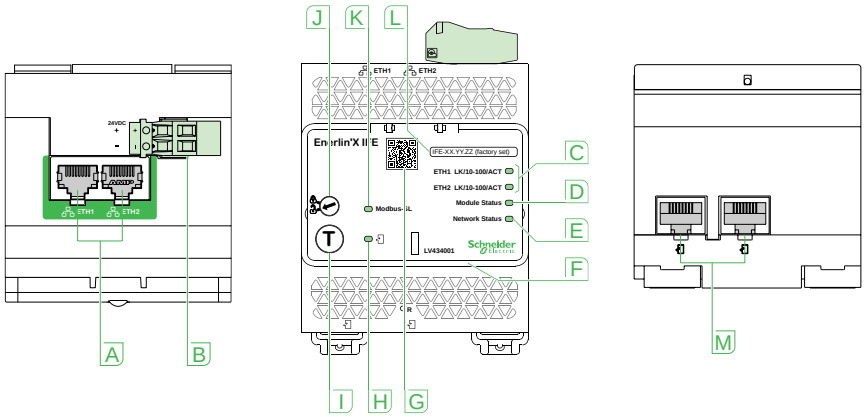
IFE Interface, IFE Switchboard Server Firmware Update

The firmware can be updated using the Ecoreach software.

Required Circuit Breaker Communication Modules

The connection to an IFE interface or to an IFE switchboard server requires ULP communication ports. Every MasterPacT MTZ fixed-type circuit breaker is equipped with a ULP port connected to its associated IFE Ethernet interface module by a prefabricated ULP cord. The IFE Ethernet interface modules are equipped with two ULP RJ45 connectors. When one is not used, it must be closed with a ULP terminator.

IFE Characteristics



A Ethernet 1 and Ethernet 2 communication port.

B 24 Vdc power supply terminal block.

C Ethernet communication LEDs:
yellow: 10 Mb
green: 100 Mb.

D Module status LED:
steady off: no power
steady green: device operational
steady red: major fault
flashing green: standby
flashing red: minor fault
flashing green/red: self-test.

E Network status LED:
steady off: no power/no valid IP address
steady green: connected, valid IP address
steady orange: default IP address
steady red: duplicated IP address
flashing green/red: self-test.

F Sealable transparent cover.

G QR code to product information.

H ULP status LED.

I Test button (accessible with cover closed).

J Locking pad.

K Modbus traffic status LED (LV434002 only).

L Device name label.

M ULP ports.

IFE Web Page Description

Monitoring Web Page:

- Real time data
- Device logging.

Control Web Page:

- Single device control.

Diagnostics Web Page:

- Statistics
- Device information
- IMU information
- Read device registers
- Communication check.

Maintenance Web Page:

- Maintenance log
- Maintenance counters.

Setup Web Page:

- Device localization/name
- Ethernet configuration (dual port)
- IP configuration
- Modbus TCP/IP filtering
- Serial port
- Date and time
- E-mail server configuration
- Alarms to be e-mailed
- Device list
- Device logging
- Device log export
- SNMP parameters
- Documentation links
- Preferences
- Advanced services control
- User accounts
- Web page access.

IFE General Characteristics

General Characteristics		
Environmental Characteristics		
Conforming to standards		IEC 60950, UL 60950
Certification		cULus, CE, EAC
Ambient temperature	storage	-40 to +85°C (-40 to +185°F)
	operation	-25 to +70°C (-13 to +158°F)
Relative humidity		5 - 85%
Level of pollution		Level 3
Protective treatment		ULV0 conforming to IEC/EN 60068-2-30
Mechanical Characteristics		
Shock resistance		Conforming to IEC/EN 60068-2-27 15 g / 11 ms, 1/2 sinusoidal
Resistance to sinusoidal vibrations		Conforming to IEC/EN 60068-2-6 5 Hz < f < 8.4 Hz
Electrical Characteristics		
Consumption		150 mA at 24 Vdc
Resistance to electrostatic discharge		IEC/EN 61000-4-2: • 8 kV air discharge • 6 kV contact discharge
Immunity to radiated fields		IEC/EN 61000-4-3: 10 V/m
Immunity to fast transient perturbations		IEC/EN 61000-4-4: 2 kV
Immunity to surges		IEC/EN 61000-4-5: 2 kV common mode
Immunity to conducted radio frequency field		IEC/EN 61000-4-6: 10 V
Physical Characteristics		
Dimensions		72 x 105 x 71 mm (2.83 x 4.13 x 2.79 in.)
Mounting		DIN rail
Weight		182.5 g (0.41 lb)
Degree of protection of the installed IO module		• On the front panel (wall mounted enclosure): IP4x • Connectors: IP2x • Other parts: IP3x
Connections		Screw type terminal blocks

Smart System IO Application Module

IO Application Module Description

IO Application Module

The IO input/output application module for LV circuit breakers is one of the components of ULP architecture. Built in functions and applications enhance control and monitoring needs.

ULP system architecture including IO modules can be built without any restrictions using a wide range of circuit breakers:

- MasterPacT MTZ1/MTZ2/MTZ3/NT/NW circuit breakers
- PowerPacT P- and R-frame circuit breakers
- PowerPacT H-, J-, and L-frame circuit breakers

The IO application module is compliant with the ULP system specifications.
Two IO application modules can be connected to each circuit breaker on the same IMU.

IO Input/Output Interface for LV Circuit Breaker Resources

The IO application module resources are:

- Six self-powered digital inputs for either NO and NC dry contact or pulse counter.
- Three bistable relay digital outputs (5 A maximum).
- One analog input for a Pt100 temperature sensor.

Pre-Defined Applications

Use the nine-position rotary switch on the front of the IO module to select a pre-defined applications. Each position is assigned to a predefined application except position 9, which allows the user to define a specific application using the EcoStruxure Power Commission Software. The switch is factory set to predefined application 1.

For each pre-defined application the input/output assignment and the wiring diagram are predefined. No additional setting with the customer engineering tool is required.

The IO module and other resources not assigned to the predefined applications are free for user specific applications.

User Applications

The user applications with the corresponding resources are defined by means of the EcoStruxure Power Commission Software. They use the resources not assigned to the predefined applications. User applications can be used for:

- Protection improvement
- Circuit breaker control
- Motor control
- Energy management
- Monitoring

24 Vdc Power Supply

The IO module must be supplied with either a 24 Vdc AD or with a 24 Vdc ABL8 RPS power supply.

> **NOTE:** The +/- of the power supply must be connected to the +/- terminals of the IO module. Crossing the polarities may damage the device.

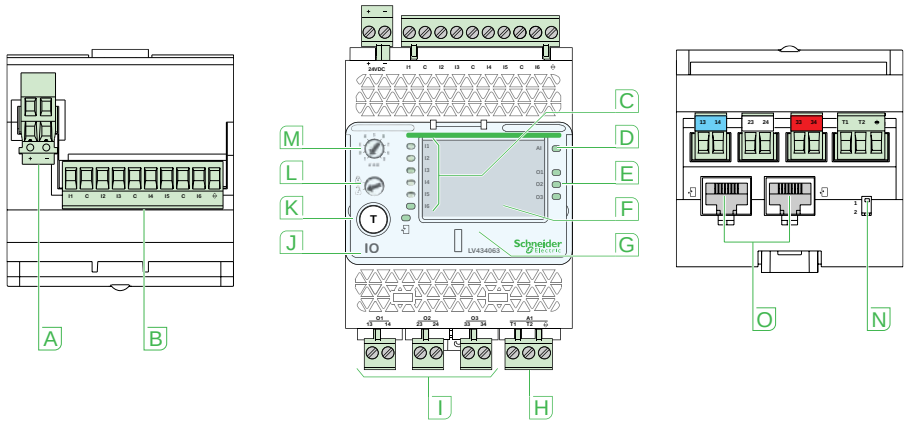
Mounting

The IO module is a DIN rail mounted device.

Setting IO Application Module Locking Pad

The setting locking pad on the front panel of the IO module enables/disables the setting of the IO module using the EcoStruxure Power Commission Software.

IO Application Module Characteristics



- A 24 Vdc power supply terminal block
- B Digital input terminal block: 6 inputs, 3 commons and 1 shield
- C 6 input status LEDs
- D Analog input status LED
- E 3 output status LEDs
- F IO application module identification labels
- G Sealable transparent cover
- H Analog input terminal block
- I Digital output terminal blocks
- J ULP status LED
- K Test/reset button (accessible with cover closed)
- L Setting locking pad
- M Application rotary switch: 1 to 9
- N Switch for IO addressing (IO 1 or IO 2)
- O ULP connectors

General Characteristics		
Environmental Characteristics		
Conforming to standards		IEC 60950, UL 60950
Certification		CE, cULus, EAC
Ambient temperature	storage	-40 to +85°C (-40 to +185°F)
	operation	-25 to +70°C (-13 to +158°F)
Relative humidity		5 - 85%
Level of pollution		Level 3
Protective treatment		ULV0 conforming to IEC/EN 60068-2-30
Mechanical Characteristics		
Shock resistance		Conforming to IEC/EN 60068-2-27: 15 g / 11 ms, 1/2 sinusoidal
Resistance to sinusoidal vibrations		Conforming to IEC/EN 60068-2-6: 5 Hz < f < 8.4 Hz
Electrical Characteristics		
Consumption		165 mA at 24 Vdc
Resistance to electrostatic discharge		IEC/EN 61000-4-2: 8 kV air discharge, 6 kV contact discharge
Immunity to radiated fields		IEC/EN 61000-4-3: 10 V/m
Immunity to fast transient perturbations		IEC/EN 61000-4-4: 2 kV
Immunity to surges		IEC/EN 61000-4-5: 2 kV common mode
Immunity to conducted radio frequency field		IEC/EN 61000-4-6: 10 V
Physical Characteristics		
Dimensions		71.7 x 116 x 70.6 mm (2.82 x 4.57 x 2.78 in.)
Mounting		DIN rail
Weight		229.5 g (0.51 lb)
Degree of protection of the installed IO application module		On the front panel (wall mounted enclosure): IP4x
		IO parts: IP3x
		Connectors: IP2x
Connections		Screw type terminal blocks

Input and Output Characteristics		
Digital Inputs		
Digital input type	Self powered digital input with current limitations as per IEC 61131-2 type 2 standards (7 mA)	
Input limit values at state 1 (close)	19.8–25.2 Vdc, 6.1 - 8.8 mA	
Input limit values at state 0 (open)	0–19.8 Vdc, 0 mA	
Maximum cable length	10 m (33 ft.)	
NOTE: For a length greater than 10 m (33 ft.) and up to 300 m (984 ft.), it is mandatory to use a shielded twisted cable. The shield cable is connected to the IO functional ground of the IO application module.		
Digital Outputs		
Digital output type	Bistable relay	
Rated voltage	250 Vac maximum [53]/ 30 Vdc	
Rated carry current	5 A	
Contact resistance	30 mΩ	
Maximum operating frequency	18,000 Operations/hr (Mechanical)	
	1800 Operations/hr (Electrical)	
Digital output relay protection by an external fuse	External fuse of 5 A or less	
Maximum cable length	10 m (33 ft.)	
Analog Inputs		
IO application module analog input can be connected to a Pt100 temperature sensor.		
Range	-30 to 200°C	-22 to 392°F
Accuracy	±2°C from -30 to 20°C	±3.6°F from -22 to 68°F
	±1°C from 20 to 140°C	±1.8°F from 68 to 284°F
	±2°C from 140 to 200°C	±3.6°F from 284 to 392°F
Refresh interval	5 s	5 s

53. 250 Vac OVC 2 according IEC/EN 60947-2 .
For OVC three and four surge arresters are required on the polarizing voltage of the output contacts.

Smart System FDM128 Display Unit

MicroLogic X control units measurement capabilities come into full play with the FDM128 display unit. It connects to Ethernet communication via RJ45 port and displays MicroLogic X control unit information.


FDM128 display.

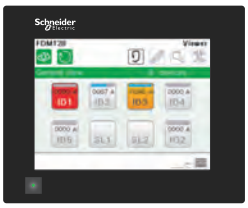
FDM128 Display

The FDM128 is an intelligent Ethernet touch screen. It collects the data from devices via the Ethernet network. It is designed to manage up to eight devices such as:

- MasterPacT MTZ1,MTZ2, MTZ3, NT, and NW circuit breakers
- PowerPacT P- and R-frame circuit breakers
- PowerPacT H-, J-, and L-frame circuit breakers

The FDM128 switchboard display unit can be connected to a MicroLogic X control unit via an IFE or an EIFE interface module. It is easy to use and requires no special software or programming.

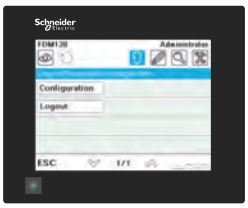
The FDM128 has a large screen which requires little depth for mounting or installation. The anti-glare graphic screen has a backlight for easy reading even under poor ambient lighting and at sharp angles.


General view

Display of MicroLogic X Measurements and Trips

The FDM128 is intended to display the MicroLogic X control unit measurements, trips and operating information.

- The FDM128 cannot be used to modify the protection settings.
- Measurements are easily accessed via a menu.
- Trips are automatically displayed.
- A pop-up window displays the time-stamped description of the trip.


Role base access control

Status Indications

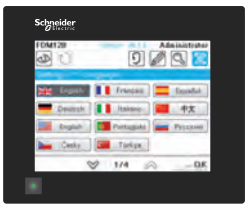
When the circuit breaker is equipped with the Command Module, the FDM128 display can also be used to view circuit breaker status conditions:

- ON/OFF (OF)
- Spring loaded (CH)
- Overcurrent trip indication (overload, short circuit, ground fault) (SDE)
- Cradle management with EIFE (CE, CD, CT)


Editing devices

Remote Control

When the circuit breaker is equipped with communicating XF, MX, or MN devices, the FDM128 display can also be used to control the circuit breaker (initiation of open/close commands).


General setting

Main Characteristics

- 115.2 x 86.4 mm (4.54 x 3.50 in.) with 5.7 in. QVGA display 320 x 240 pixels
- Color TFT LCD, LED backlight
- Wide viewing angle: vertical ± 80°, horizontal ± 70°
- High resolution: excellent reading of graphic symbols
- Operating temperature range -10°C to +55°C (-14°F to +131°F)
- CE / UL / CSA marking
- 24 Vdc power supply
- Consumption ≤ 6.8 W
- One RJ45 Ethernet jack

Mounting and Protection

- The FDM128 is easily installed in electrical equipment.

- Standard door hole Ø 22 mm (0.87 in.).
- The FDM128 degree of protection is IP65.

FDM128 Main Menu


Quick View

General view
Provides in one shot the information about the status of each monitored device

Role base access control
Allows management of logins and passwords.


Measures

Editing devices
Allows specification of the devices monitored by the FDM128.

Communication setting
Allows setting of the communication parameters.


Alarm History

General setting
Allows selection of the language and setting of the other parameters of FDM128

FDM128 Display Unit Sub Menus

Quick view

Provides access to five screens that display a summary of essential operating information (I, U, f, P, E, THD, circuit breaker On/off), and protection settings.

Measures

Displays all measurements (I, U, V, f, P, Q, S, E, THD, PF) with the corresponding min/max values.


Control

Alarms history

Displays tripping and alarms histories.

Control

Displays the status of the devices (Open/Closed) and allows initiation of control commands (Open/Close/Reset)


Maintenance

Maintenance

Displays all circuit breaker condition indications and all the information generated by the diagnostic functions (number of operations, contact wear, operating time, internal temperature etc.)

Customer Engineering Tool: EcoStruxure Power Commission Software

EcoStruxure Power Commission Software

Definition

EcoStruxure Power Commission Software helps the user manage a project as part of the testing, site commissioning, and maintenance phases of the project life cycle.

With EcoStruxure Power Commission Software, electrical devices can be configured, tested and commissioned in the simplest way.

EcoStruxure Power Commission Software reduces the commissioning time of Smart Systems and supports the system during operation & maintenance.

EcoStruxure Power Commission Software offers valuable added features like automatic discovery of connected devices, performs communication tests, generates comprehensive reports, upgrades firmware etc.

Description

EcoStruxure Power Commission Software enables the user to perform the following actions for the devices and modules listed in the table below:

- Create projects by device discovery.
- Perform circuit breaker and communication tests and generate reports.
- Configuration or settings download and upload for multiple devices.
- Install digital modules.
- Compare settings between the project (original settings) and device (current settings).
- Generate comprehensive project reports.
- Check system level firmware status and upgrade devices.
- Secured repository of projects in Cloud.
- Read information (alarms, measurements, parameters) & display diagnostic information.
- Waveform capture.

USB and Ethernet Interfaces

EcoStruxure Power Commission Software provides access to MasterPacT MTZ devices through USB and Ethernet interfaces. The following table indicates the features that are accessible through each interface:

Features	USB	Ethernet
Protection/Alarm settings	Yes	Yes
Firmware upgrade	Yes	No
Digital modules installation	Yes	No
Device Checkup	Yes	Yes
IO Module Configuration	Yes	Yes

EcoStruxure Power Commission Software Key Features

Device Discovery:

EcoStruxure Power Commission Software helps the user to discover the communicating devices in electrical equipment either through Ethernet or a serial network. Once the devices are discovered, the user can add those devices to the project area.

Device settings:

EcoStruxure Power Commission Software helps the user to set the protection settings and the alarms of the MasterPacT MTZ devices including dual settings and IO module configuration.

Communication Test:

When a user has installed communicating devices in electrical equipment, EcoStruxure Power Commission Software offers the capability to test the communication network. Once a communication test is done, the user can generate a time stamped communication test report.

Reports

EcoStruxure Power Commission Software offers the following reports to the users

- Circuit breaker and communication test reports
- Comprehensive project report
- Logs and trip history reports

Firmware Upgrade

EcoStruxure Power Commission Software offers a system compatibility check and firmware upgrade for the following devices.

- MicroLogic X control units
- EIFE / IFE / IFM
- IO modules

Digital Modules Support

EcoStruxure Power Commission Software helps the user to buy digital modules which allows digital customization of the devices.

EcoStruxure Power Commission Software directs the user to the GoDigital platform to purchase digital modules.

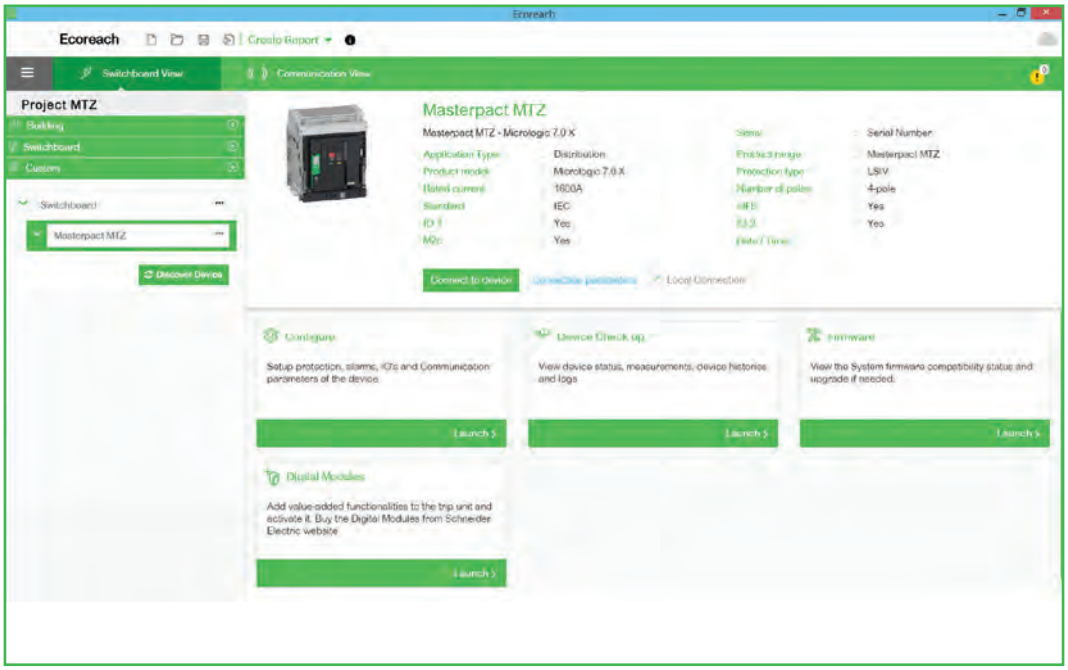
After purchase, EcoStruxure Power Commission Software helps to install/uninstall the digital modules in the MicroLogic X control unit in a secured way.

Sharing with EcoStruxure Facility Expert

EcoStruxure Power Commission Software offers the chance to share project with Facility Expert. A digital logbook is then automatically created for the MasterPacT MTZ device.

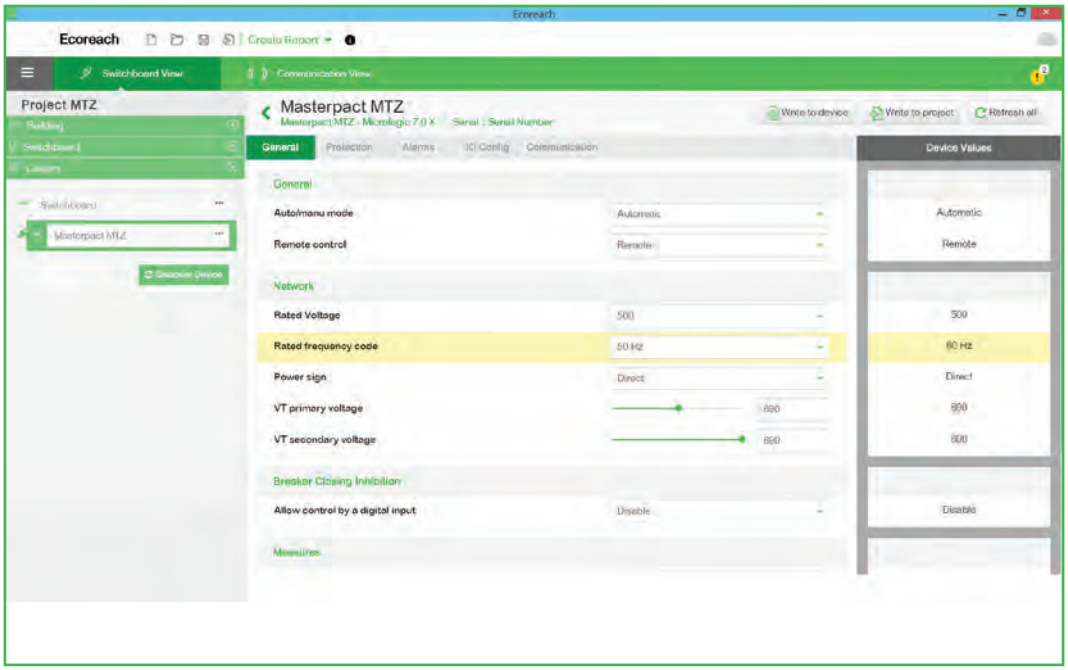
EcoStruxure Power Commission Software Operations

Screen: Device Homepage



The user can connect to the device from the device home page and do the settings configuration, do a device check up, view maintenance information, upgrade the device with the latest firmware & install/uninstall digital modules.

Screen: General View

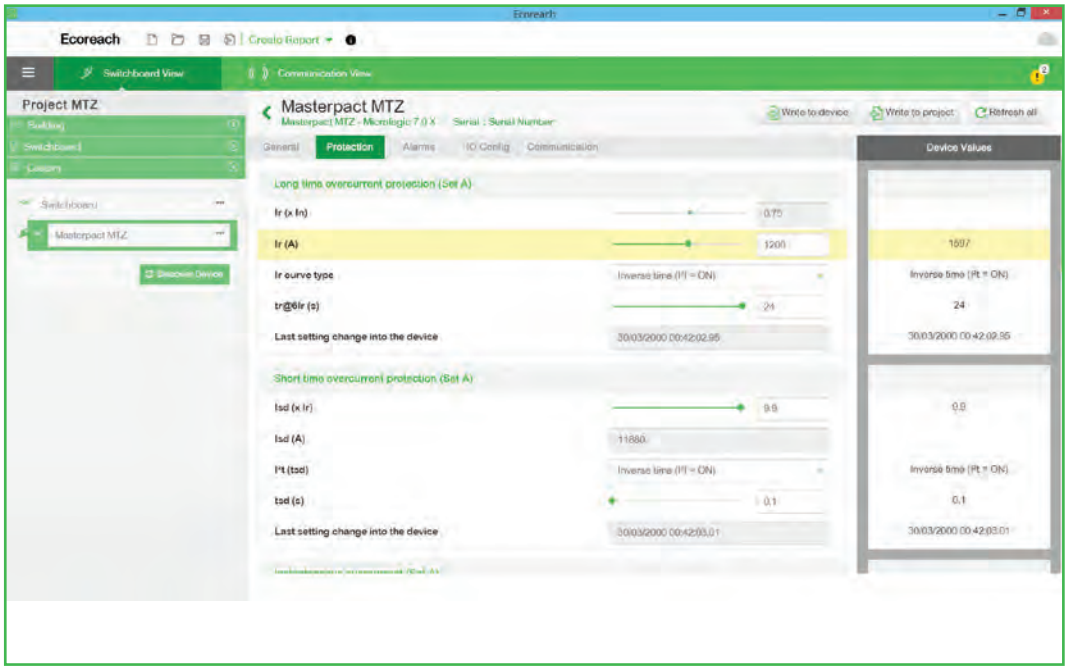


Through the welcome screen, a user can create a project, have access to devices and discover them.

The welcome screen allows the user to open reports to have view of his projects, to modify them, to check if they are synchronized with the cloud and if they are shared with EcoStrucxure Facility expert.

The user can change the language and have access to the help files and to device firmware baseline file.

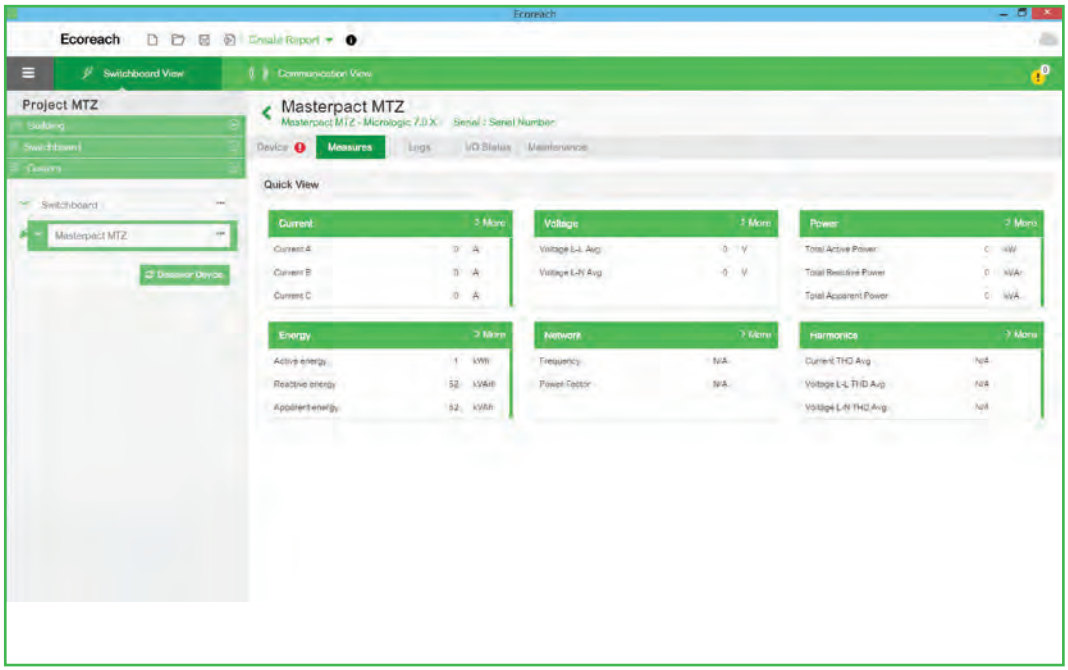
Screen: Protections



Once the user clicks on configuration, this screen appears, through which the user can read/ write different settings and check the settings discrepancies.

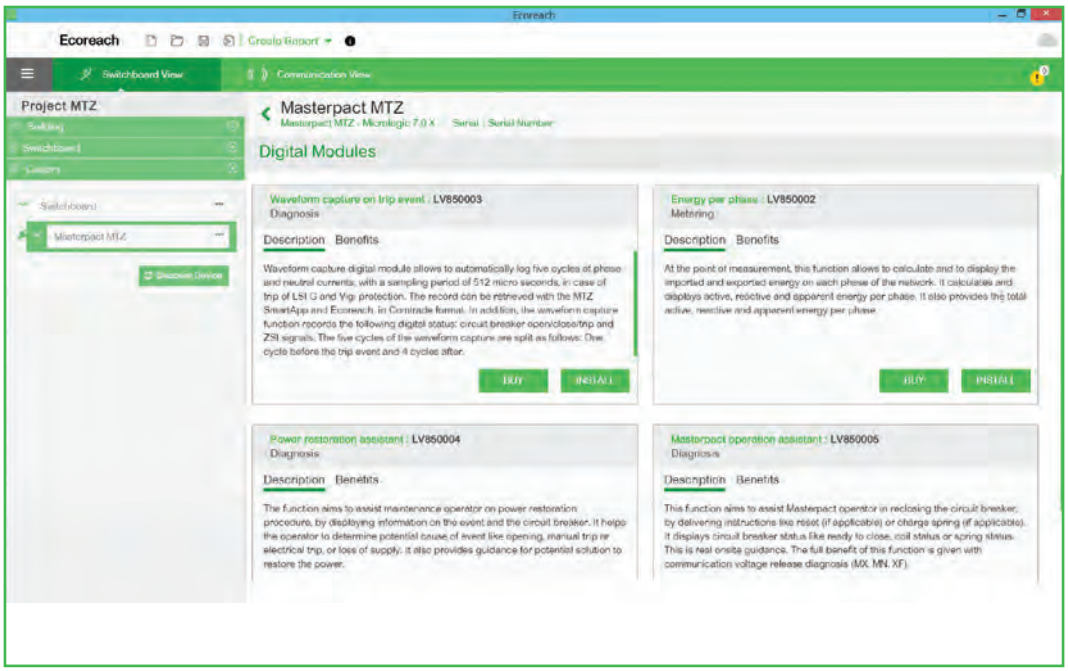
The user can change the language and have access to the help files and to device firmware baseline file.

Screen: Measures



Once the user clicks on Device Checkup section from the device home page, this screen appears and the user can view the measurement parameters, IO status , Alarms logs, maintenance parameters etc.

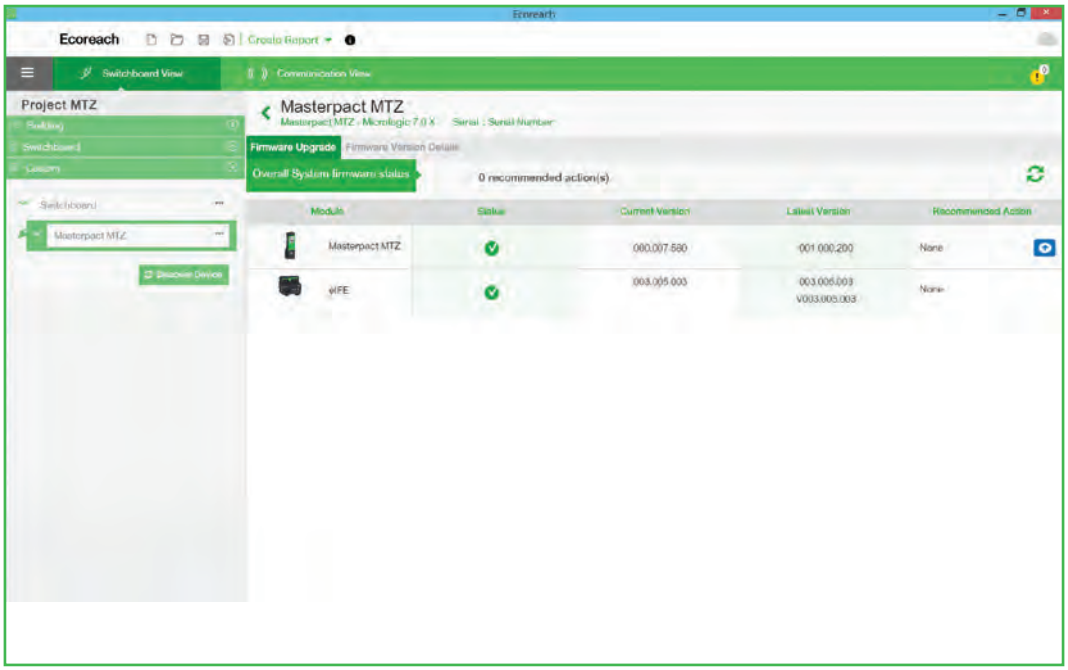
Screen: Digital Modules



Once the user clicks on Digital modules, this screen appears and the user can buy the desired digital module specific to the device & install the digital module to the device.

Once the user clicks on configuration, this screen appears, through which the user can read/ write different settings and check the settings discrepancies.

Screen: Firmware Upgrades



Through the Firmware Upgrade screen, a user can check the compatibility of the firmware versions of the devices and modules connected and upgrade them when needed with the device firmware baseline file.

MasterPacT MTZ Integration in Electrical Equipment

MasterPacT MTZ Electrical Equipment Operating Conditions

MasterPacT MTZ test conditions reproduce different customer environments, in accordance with product and installation standards and relevant maintenance operations [54] to maximize the product lifespan.

Selecting MasterPacT MTZ2 Circuit Breakers, page 11

Operating Conditions

MasterPacT MTZ devices are designed for specified operating conditions in terms of temperature, humidity, vibration, altitude, corrosion, and electromagnetic disturbances.

Beyond the limits defined here, the circuit breakers suffer accelerated aging that may rapidly result in equipment breakdowns.

Refer to the MasterPacT Maintenance Guide for additional information and consult Schneider Electric to confirm mechanical and electrical performances in severe conditions.

Examples of applications with severe operating conditions:

- wind turbines
- power frequency converters installed in the same electrical equipment or close to the MasterPacT circuit breaker
- emergency generators
- high vibration marine applications such as thrusters and anchor positioning systems

Safety of Operations

The front face of the MasterPacT MTZ device provides reinforced insulation (Class 2) according to IEC 60664-1. It allows Class 2 installation with circuit breaker control from outside.

54. For full details, please read the MasterPacT maintenance guide.

Ambient Temperature

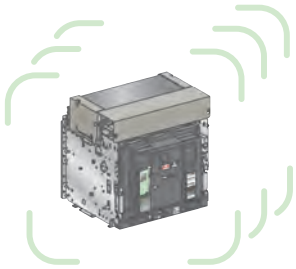
MasterPacT MTZ devices are designed to operate in ambient temperature between -25°C (-13°F) and +70°C (+158°F), providing that the temperature around the circuit breaker inside the enclosure does not exceed +70°C (+158°F). If this condition cannot be fulfilled, dedicated measures such as HVAC must be taken.

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

- Dry cold at -40°C (-40°F) (IEC 60068-2-1)
- Dry heat at +85°C (+185°F) (IEC 60068-2-2)
- Damp heat (temperature +55°C (+131°F), relative humidity 95%) (IEC 60068-2-30)

MasterPacT MTZ Circuit Breakers Ambient Temperatures					
Shipping & Storage		**Installation & Commissioning**		**Inside the Electrical Equipment Containing the Circuit Breaker**	
Temperature	Relative Humidity	Temperature	Relative Humidity	Temperature	Relative Humidity
-40°C / +85°C (-40°F / +185°F)	0 to 95%	-25°C / +70°C (-13°F / +158°F)	0 to 95%	-25°C / +70°C (-13°F / +158°F)[55]	0 to 95%

Vibration Tests

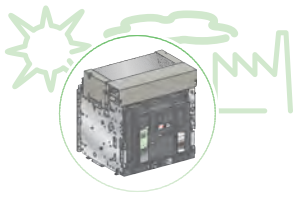


MasterPacT MTZ devices have successfully passed testing in compliance with IEC 60068-2-6 for the following vibration levels:

- 2 to 13.2 Hz: amplitude ±1 mm
- 13.2 to 100 Hz: constant acceleration 0.7 g

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

Industrial Environmental Atmospheric Conditions



MasterPacT MTZ devices have successfully passed the tests defined by IEC 60068-2-52 level 2: salt mist for extreme atmospheric conditions:

MasterPacT devices can operate in the industrial environments defined by standard IEC/EN 60947-1 (pollution degree up to 3).

It is nevertheless advised to check that the devices are installed in suitably cooled electrical equipment without excessive dust.

Profile	Pollutions	Active Substances
Corrosive industrial atmospheres	Category 3C3 compliant with IEC 60721-3-3	
Sea salts	Compliant with IEC 60721-2-5	0.8 to 8 mg/(m^2. day) Average over the year
Mechanically active substances	Category 3S3 compliant with IEC 60721-3-3	

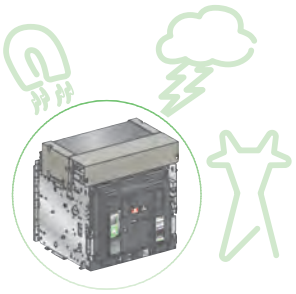
Beyond these conditions, MasterPacT MTZ devices must be installed inside electrical equipment with an enclosure rating equal to or greater than a NEMA 13 rating.

55. Manual closing of circuit breaker (using pushbutton) is possible down to -35°C (-31°F).

Altitude

Altitude Correction Factors per ANSI C37.20.1 par. 7.1.4.1			
Altitude	**< 2000 m (6600 ft.)**	**2600 m (8500 ft.)**	**3900 m (13,000 ft.)**
Voltage	1.00	0.95	0.80
Current	1.00	0.99	0.96

Electromagnetic Disturbances



MasterPacT MTZ devices are protected against:

- Overvoltages caused by devices that generate electromagnetic disturbances.
- Overvoltages caused by atmospheric disturbances or by a distribution-system outage (for example, failure of a lighting system).
- Devices emitting radio waves (radios, walkie-talkies, radar, etc.).
- Electrostatic discharges produced by users.

MasterPacT MTZ devices have successfully passed the electromagnetic compatibility tests (EMC) defined by IEC/EN 60947-2, Annex F.

This testing reduces the chance of:

- Nuisance tripping
- Tripping times outside of published curves

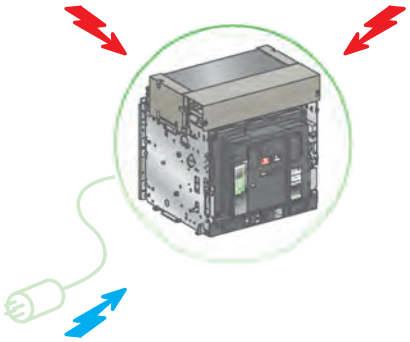
Immunity: ability of a device to operate without damage in the presence of an electromagnetic disturbance.

Susceptibility: inability of a device to operate without damage in the presence of an electromagnetic disturbance.

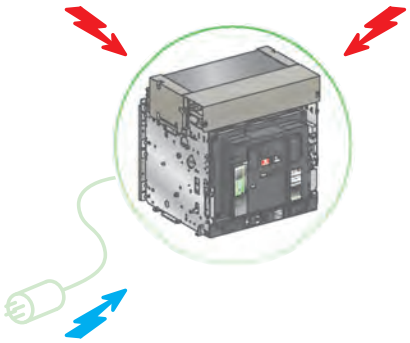
Conducted interference: disturbances generated by the device and transmitted by the conductors (of power supply, signalling, or control) in the form of electrical voltage.

Radiated interference: disturbances generated by the device and radiated in the environment in the form of electromagnetic waves.

MasterPacT MTZ Electromagnetic Immunity

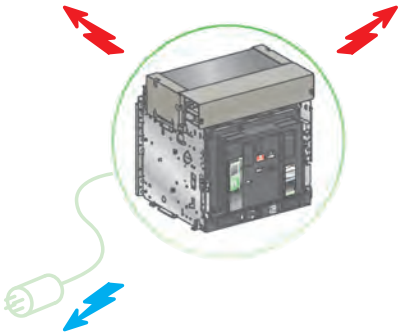


Electromagnetic Compatibility (EMC)	Standard	Level	Test Values Required by IEC 60947-2	Tested Extra EMC Performances
To Conducted Disturbances				
Electrical fast transient/ burst (EFBT/B)	IEC 61000-4-4	—	4 kV ; 5 kHz on poles and all AC supplies 2 kV ; 5 kHz on auxiliaries DC supply and signal ports	4 kV ; 5 kHz and 100 kHz on poles and all AC supplies 2 kV ; 5 kHz and 100 kHz on auxiliaries DC supply and signal ports
Surges	IEC 61000-4-5	4	4 kV CM, 2 kV DM on poles and AC supply > 100 V 2 kV CM, 1 kV DM on AC supply < 100 V	6.6 kV CM, 4.4 kV DM on poles. 4 kV CM, 2 kV DM on MX-XF-MN voltage releases for supply > 100 V. 2 kV CM, 1 kV DM on MX-XF-MN voltage releases for supply < 100 V. 2 kV CM, 1 kV DM on 24 V DC supply. 2 kV CM, on all signals ports.
Conducted disturbances induced by radio-frequency fields	IEC 61000-4-6	4	10 V CM; 0,15…80 MHz (with CDN)	20 V CM; 0.15...80 MHz
Voltage dips, voltage sags, voltage interruption (AC supply)	IEC 61000-4-11	— — —	40 % (10/12 cycles); 70 % (25/30 cycles); 80 % (250/300 cycles) 0 % (0.5 cycle); 0 % (1 cycle); 0 % (250/300 cycles) External power supply problem: • 3 interruptions during 5 minutes; • switching-off time 30 s each case Combined voltage and frequency variations	—
Conducted low frequency	IACS— E10 (§15)	—	• AC: 50 Hz to 10 kHz ; 10 % of the rated voltage supply up to harmonic 15. Then reduction at 1% up to harmonic 100, min 3 V RMS. • DC: 50 Hz to10 kHz; Test voltage 10% of the maximum voltage supply 2 W.	—
Harmonics and Interharmonics including mains signalling at a.c. power ports	IEC 61000-4-13 3	3	—	AC supply of devices < 16 A
Immunity to conducted, common mode disturbances of main frequencies	IEC 61000-4-16	—	—	Only on pole accesses: 30-3 V; CM; 15-150 Hz; 3 V; CM; 150-1,5 kHz 3-30 V; CM; 1,5-15 kHz; 30 V; CM; 15-150 kHz
Oscillatory wave	IEC 61000-4-18	—	—	2,5 kV CM, 2,5 kV DM; 1 MHz
Voltage dips, voltage sags, voltage interruption (DC supply)	IEC 61000-4-29	—	40 % (10/12 cycles); 70 % (25/30 cycles) 0% (0,5 cycle); 0 % (50 ms); 0 % (250/300 cycles) variations on DC : U ±20%; 10 sec	40 % (10/12 cycles); 70 % (25/30 cycles) 0% (0,5 cycle); 0 % (50 ms); 0 % (250/300 cycles) variations on DC : U ±20%; 10 sec External power supply problem:



Electromagnetic Compatibility (EMC)	Standard	Level	Test Values Required by IEC 60947-2	Tested Extra EMC Performances
To Conducted Disturbances				
			External power supply problem: • 3 interruptions during 5 minutes; • switching-off time 30 s each case Voltage continuous ±10%; Voltage cyclic variation 5%; Voltage ripple10%	• 3 interruptions during 5 minutes; • switching-off time 30 s each case Voltage continuous ±10%; Voltage cyclic variation 5%; Voltage ripple10%
To Radiated Disturbances				
Electrostatic discharge IEC 61000-4-2	IEC 61000-4-2	3	8 kV air ; 8 kV contact	9,6 kV air ; 9,6 kV contact
	IACS - E10	—		
Radiated radio-frequency electromagnetic fields	IEC 61000-4-3	3	10 V/m ; 80 MHZ…1 GHz; 1.4…2 GHz 10 V/m ; 80 MHz…2 GHz 10 V/m ; 80 MHz…1 GHz; 3 V/m ; 1.4-2 GHz; 1 V/m 2-2.7 GHz	20 V/m; 80 MHZ…3 GHz
	—	—		
	—	—		
Power frequency magnetic fields	IEC 61000-4-8	—	400 A/m permanently	500 A/m permanently, 1000 A/m during 3 s
Impulse magnetic field	IEC 61000-4-9 5	5	1000 A/m (8/20 µs wave)	—
Oscillatory magnetic field	IEC 61000-4-10	—	100 A/m (100 kHz and 1 MHz)	—

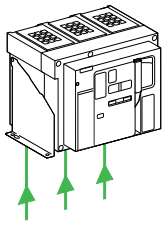
MasterPacT MTZ Electromagnetic Emission



Electromagnetic Compatibility (EMC)	Standard	Level	Test values required by IEC 60947-2
To Conducted Disturbances			
Limits for harmonic current emissions	IEC 61000-3-2 A	A	For Ie ≤ 16 A (0 to 2 kHz) and coils 240 Vac / 380 Vac
Conducted emission	CISPR 11/22	A	B (with external filters on MN/MX/XF Coils and with 24 Vdc external, please consult us)
		B	B (with external filters on MN/MX/XF Coils and with 24 Vdc external, please consult us)
	CISPR 16	A	—
To Radiated Disturbances			
Radiated emission	CISPR 11/22 CISPR 16	B	—
EMC and ERM tests compliant with: • ETSI EN 300 328 and ERC Recommendation 70-03. • FCC CFR47 Part 15, Subpart B and C, RSS-210 Issue 8 • ETSI EN 300 440-1 /-2 • ETSI EN 302 291-1 /-2.	Directive RTTE -	—	• Bluetooth technology (Low Energy and Modulation DSSS) • Proprietary connectivity • NFC (Near Field Communication)

MasterPacT MTZ Electrical Equipment Installation Rules

MasterPacT MTZ Device Installation



MasterPacT MTZ devices can be supplied either from the top or from the bottom without degrading performance, in order to facilitate connection when installed in electrical equipment.

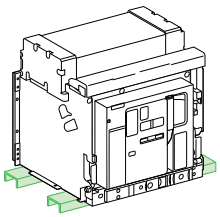
Mounting the Circuit Breaker

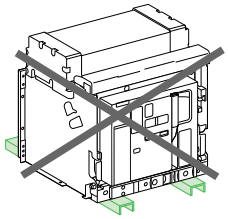
The weight of the device must be distributed uniformly over a rigid mounting surface such as rails or a base plate.

This mounting plane must be perfectly flat (tolerance on support flatness: 2 mm [0.08 in.]).

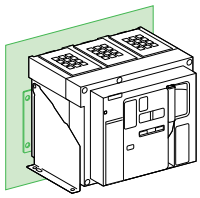
Mounting the circuit breaker to a mounting plate that does not meet the flatness requirements could interfere with the correct operation of the circuit breaker.

MasterPacT MTZ devices can also be mounted on a vertical plane using special brackets.





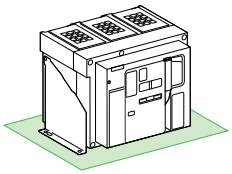
Mounting on Rails

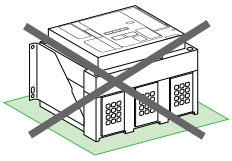


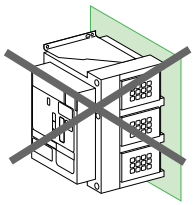
Mounting with Vertical Brackets

MasterPacT MTZ Position in Electrical Equipment

Only one position is authorized.





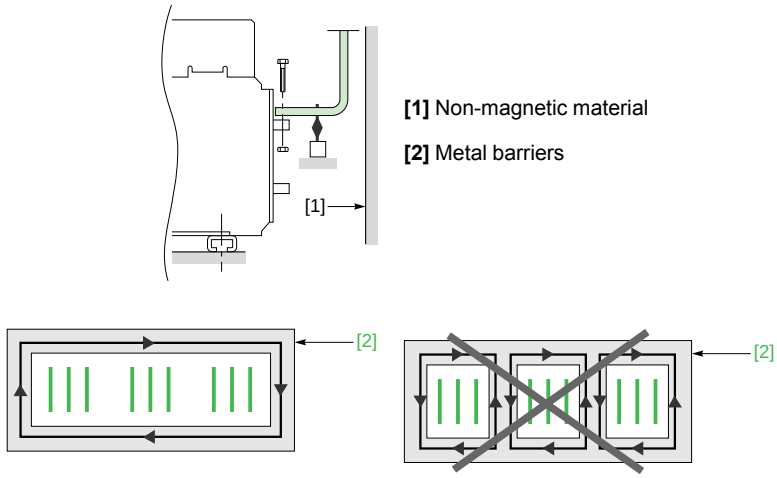


Electrical Equipment Partitions for MasterPacT MTZ Devices

Sufficient openings must be provided in partitions to maintain good air circulation around the circuit breaker. Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

For high currents, 2500 A and above, the metal supports or barriers in the immediate vicinity of a conductor must be made of non-magnetic material **[1]**.

Metal barriers **[2]** through which a conductor passes must not form a magnetic loop.



[1] Non-magnetic material

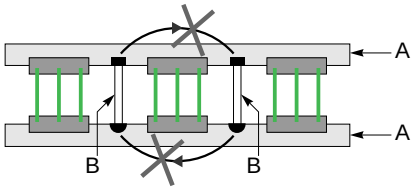
[2] Metal barriers

MasterPacT MTZ Electrical Equipment Busbars

Creating a magnetic loop around a conductor, (via the busbar support for example), must be strictly avoided.

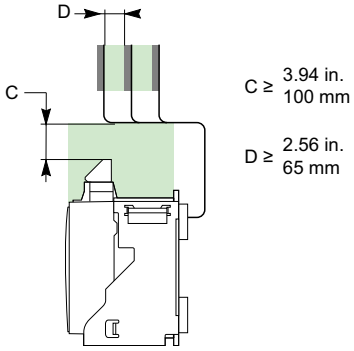
To avoid this:

- Either the busbar supports (A) and/or their mounting screws (B) must be made of non-magnetic materials.
- Maintain minimum distances for control wires (C) and busbar (D).



A) Busbar supports

B) Busbar support screws



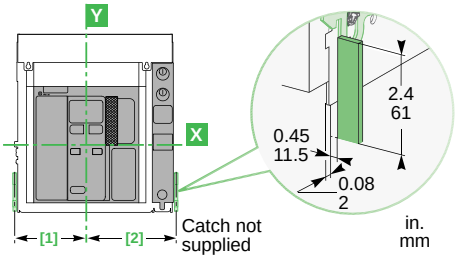
Door Interlock

Door Interlock (VPEC)

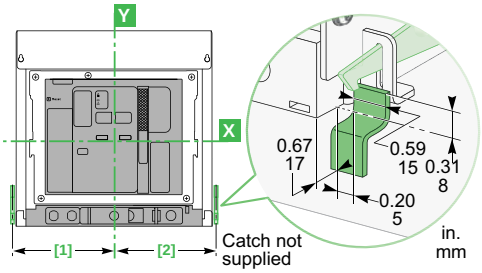
Mounted on the right or left-hand side of the cradle, this device inhibits opening of the cubicle door when the circuit breaker is in “connected” or “test” position.

If the circuit breaker is put in the “connected” position with the door open, the door may be closed without having to disconnect the circuit breaker.

Door Interlock Dimensions		
Type	Dimensions	
	[1] mm (in.)	[2] mm (in.)
MTZ1 08-16 (3P)	135 (5.31)	168 (6.61)
MTZ1 08-16 (4P)	205 (8.07)	168 (6.61)
MTZ2 08-40 (3P)	215 (8.46)	215 (8.46)
MTZ2 08-40 (4P)	330 (12.99)	215 (8.46)
MTZ3 40-63 (3P)	660 (25.98)	215 (8.46)
MTZ3 40-63 (4P)	775 (30.51)	215 (8.46)



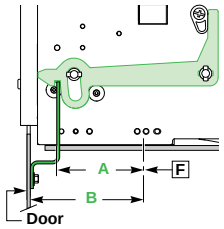
MTZ1



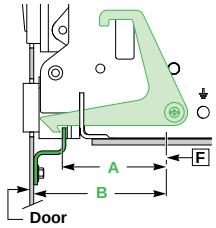
MTZ2 - MTZ3

Circuit Breaker in Connected or Test Position

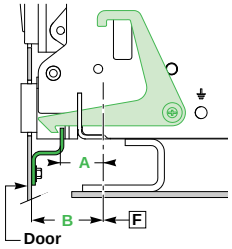
Door cannot be opened



MTZ1 06-16



MTZ2 08-40



MTZ3 40-63

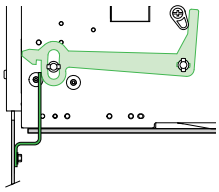
Type	Dimensions (mm)	
	A mm (in.)	B mm (in.)
MTZ1 08-16 (3P)	5 (0.197)	23 (0.906)
MTZ1 08-16 (4P)	5 (0.197)	23 (0.906)
MTZ2 08-40 (3P)	87 (3.43)	103 (4.063)
MTZ2 08-40 (4P)	87 (3.43)	103 (4.063)
MTZ3 40-63 (3P)	37 (1.46)	53 (2.09)
MTZ3 40-63 (4P)	37 (1.46)	53 (2.09)

Circuit Breaker in Disconnected Position

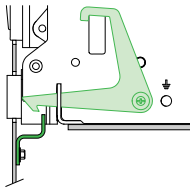
Door can be opened

Mounted on the right or left-hand side of the cradle, this device inhibits opening of the cubicle door when the circuit breaker is in the “connected” or “test” position.

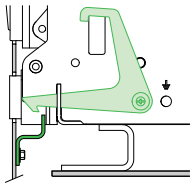
It the circuit breaker is put in the “connected” position with the door open, the door may be closed without having to disconnect the circuit breaker.



MTZ1 06-16



MTZ2 08-40



MTZ3 40-63

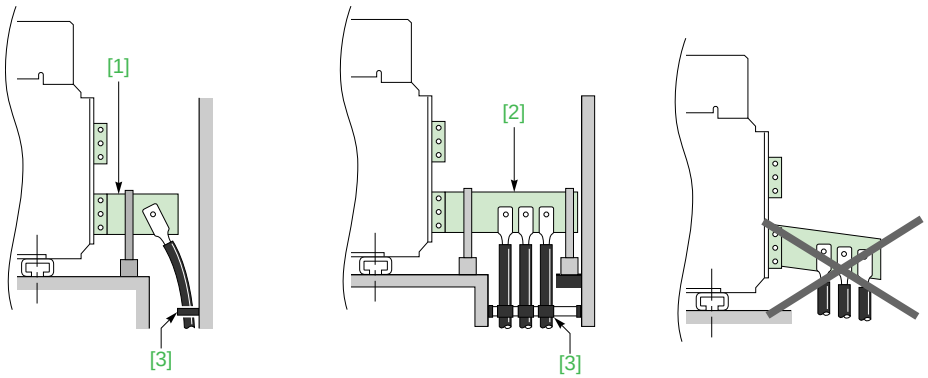
Power Connection

MasterPacT MTZ Electrical Equipment Cable Connections

If cables are used for the power connections, their weight must not be applied to the circuit breaker power terminals, but must be supported by the panel structure.

For this, make the connections as follows:

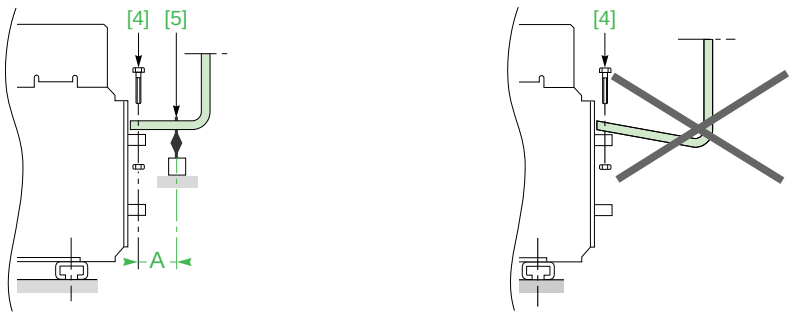
- Extend the device terminals using short bars designed and installed according to the recommendations for bar-type power connections (see figure below):
  - For a single cable, use solution **[1]**.
  - For a multiple cables, use solution **[2]**.
- In all cases, follow the general rules for connections to busbars:
  - Position the cable lugs before inserting the bolts.
  - Firmly secure the cables to the framework **[3]**.



Busbar Connections

Install with a maximum distance A between busbar to circuit breaker connection and the first busbar support or spacer with respect to the value of the prospective short-circuit current.

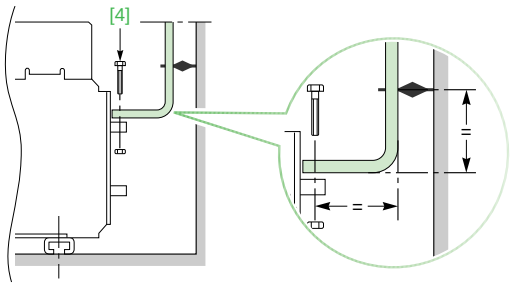
- The busbars must be suitably adjusted so that the connection points are positioned on the power terminals before the bolts **[4]** are inserted.
- The busbars weight must be supported by the busbar supports **[5]** that are solidly fixed to the electrical equipment framework and not by the circuit breaker power terminals.



Electrodynamic Stresses

The first busbar support must be situated within the maximum distance **(A)** from the power terminal of the circuit breaker. This distance is required so that the busbar can withstand the electrodynamic stresses between phases in the event of a short circuit. The table below gives the maximum distance **(A)** according to the prospective short-circuit current Isc.

Maximum Distance (A) Based on Prospective Short Circuit Current



Maximum Distance A	
Short Circuit Current (kA)	Maximum Distance A mm (in.)
30	350 (13.8)
50	300 (11.8)
65	250 (9.84)
80	150 (5.91)
100	150 (5.91)

Temperature Derating

The current rating of a high-ampere circuit breaker is highly dependent on the actual conditions of installation and connection. Thus it is not possible to give strict values of current rating without performing a temperature rise test in the actual electrical equipment configuration.

Temperature Correction Factors													
	Maximum Ambient Temperature												
°C	70	60	50	40	30	25	20	10	0	-10	-20	-35	-30
°F	158	140	122	104	86	77	68	50	32	14	-4	-13	-22
Current	0.75	0.83	0.92	1	1.07	1.11	1.14	1.21	1.27	1.33	1.39	1.42	1.44

MasterPacT MTZ Minimum Enclosure Sizes

MasterPacT MTZ1								
Circuit Breaker		Circuit Breaker Enclosure Dimensions (H x W x D)		Ventilation Area				
				Top		Bottom		Front Face
		mm	in.	mm²	in.²	mm²	in.²	
3P	800 to 1600 A (N, H, L1)	463.5 x 330.2 x 241.3	18.25 x 13 x 9.5	5,806	9	5,806	9	—
	800 to 1600 A (L)	1581.2 x 584.2 x 374.7	62.25 x 23 x 14.75	10,645	16.5	10,645	16.5	—
4P	800 to 1600 A (N, H, L1)	463.5 x 401.3 x 241.3	18.25 x 15.8 x 9.5	5,806	9	5,806	9	—
	800 to 1600 A (L)	1581.2 x 654.2 x 374.7	62.25 x 25.76 x 14.75	10,645	16.5	10,645	16.5	—

MasterPacT MTZ2 / MTZ3									
Circuit Breaker		Enclosure Dimensions (H x W x D)		Ventilation Area					
				Top		Bottom		Front Face	
		mm	in.	mm²	in.²	mm²	in.²	mm²	in.²
3P	≤ 2000 A, UL 1066 (ANSI C37.50)	539.8 x 552.5 x 400	21.25 x 21.75 x 15.75	38,460	59.62	22,980	35.62	—	—
	≤ 3000 A, UL 489	466.6 x 609.6 x 400	18.37 x 24.00 x 15.75	10,720	16.62	10,720	16.62	—	—
	3200–4000 A (MTZ2)	787.4 x 552.5 x 400	31.00 x 21.75 x 15.75	38,460	59.62	—	—	60,390	93.6
	4000–6000 A, UL 1066 (ANSI C37.50)	838.2 x 828.5 x 400	33.00 x 32.62 x 15.75	128,230	198.75	—	—	84,190	130.5
	4000–6000 A, UL 489	552.5 x 914.4 x 400	21.75 x 36.00 x 15.75	10,720	16.62	10,720	16.62	—	—
4P	≤ 2000 A, UL 1066 (ANSI C37.50)	539.8 x 667.5 x 400	21.25 x 26.28 x 15.75	38,460	59.62	22,980	35.62	—	—
	≤ 3000 A, UL 489	466.6 x 762.0 x 400	18.37 x 30.00 x 15.75	10,720	16.62	10,720	16.62	—	—
	3200–4000 A (MTZ2) UL 1066 (ANSI C37.50)	787.4 x 667.5 x 400	31.00 x 26.28 x 15.75	38,460	59.62	—	—	60,390	93.6
	4000–6000 A, UL 1066 (ANSI C37.50)	838.2 x 1058.7 x 400	33.00 x 41.68 x 15.75	128,230	198.75	—	—	84,190	130.5
	4000–6000 A, UL 489	552.5 x 1168.4 x 400	21.75 x 45.00 x 15.75	10,720	16.62	10,720	16.62	—	—

MasterPacT MTZ Circuit Breaker Dimensions

Visit the Schneider Electric Download Center to access the following MasterPacT MTZ documents and downloads:

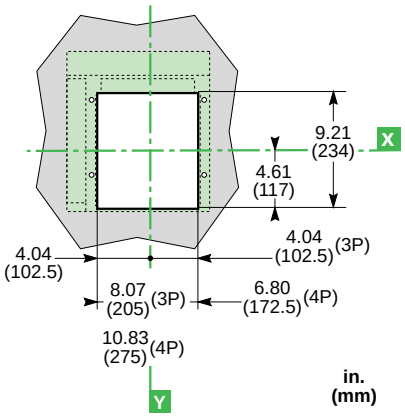
- MTZ 3D Drawings
- MTZ 2D Drawings
- Certificates
- User Guides
- Instruction Sheets

MasterPacT MTZ Accessories

Rear Panel Cutout (Drawout Devices)

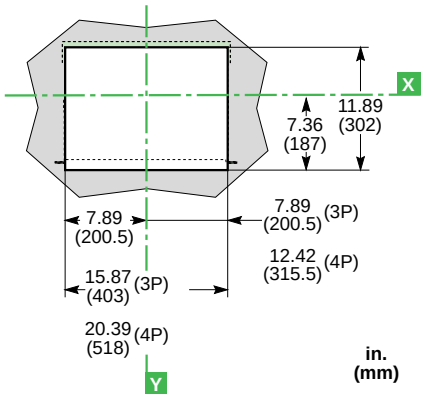
MTZ1

Rear View



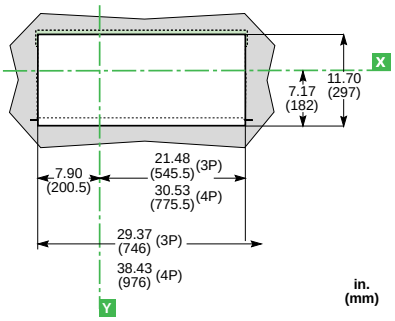
MTZ2 08 to MTZ2 40

Rear View



MTZ3 40 to MTZ3 63

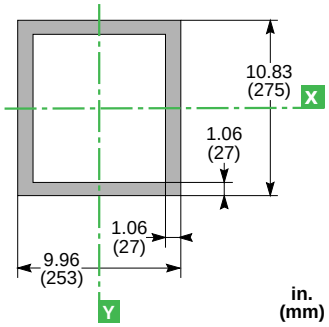
Rear View



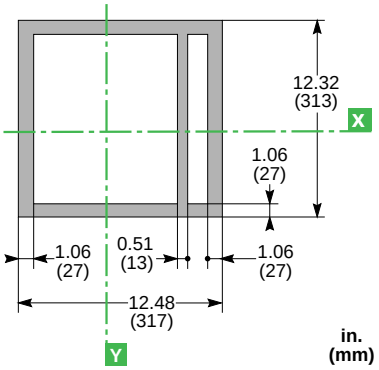
Escutcheon

MasterPacT MTZ1

Fixed Device

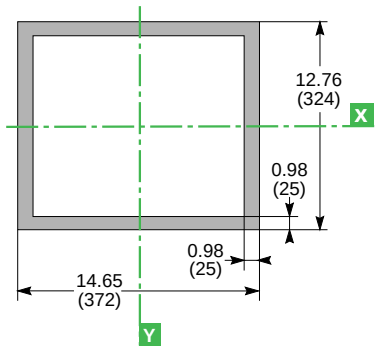


Drawout Device

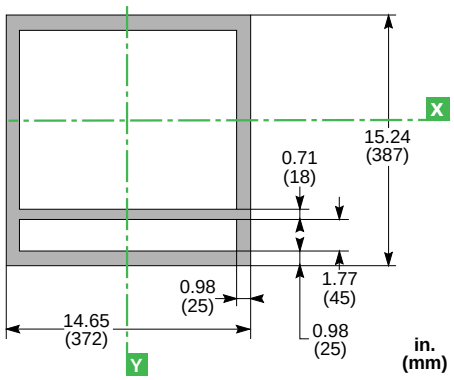


MasterPacT MTZ2/MTZ3

Fixed Device

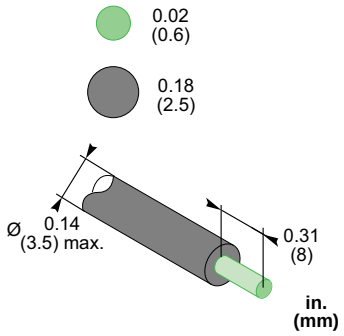


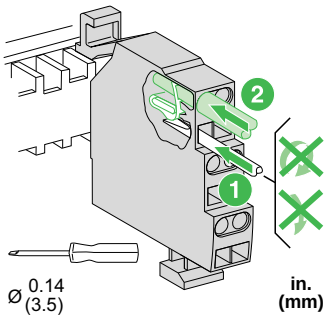
Drawout Device



MasterPacT MTZ External Accessories

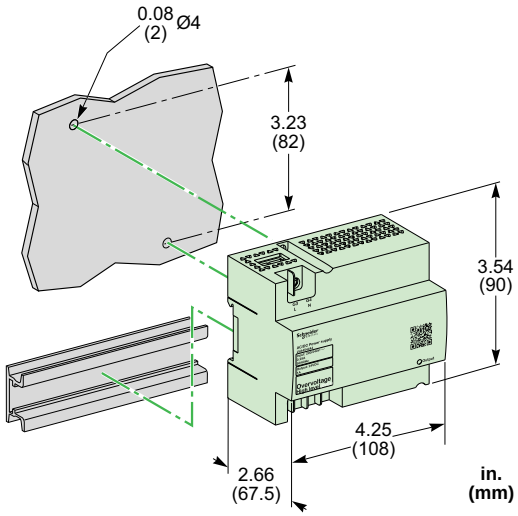
Connection of Auxiliary Wiring to Terminal Block



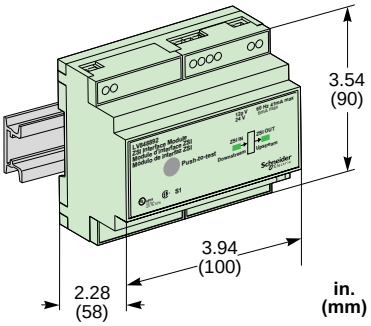


One conductor only per connection point.

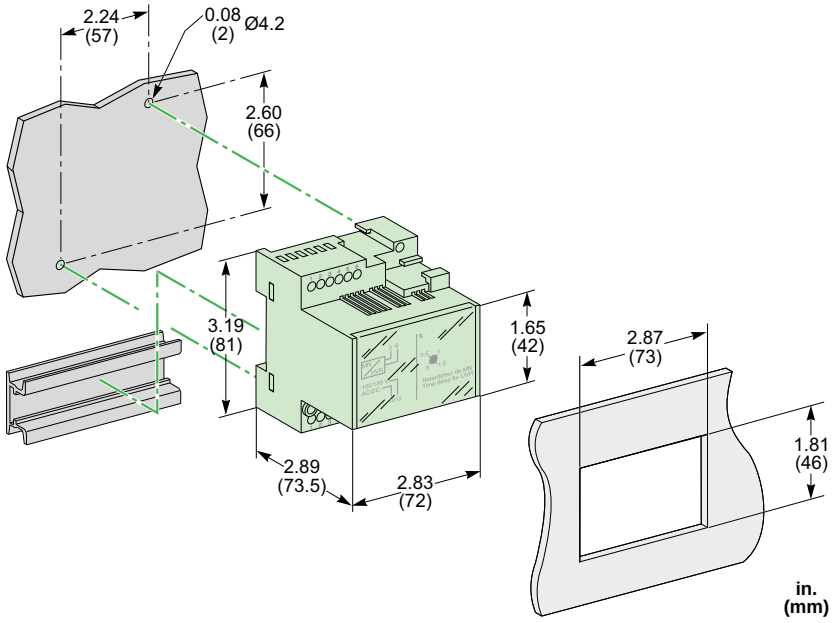
External Power Supply Module (AD)



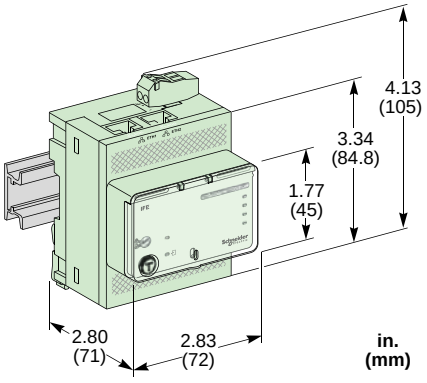
ZSI Interface Module



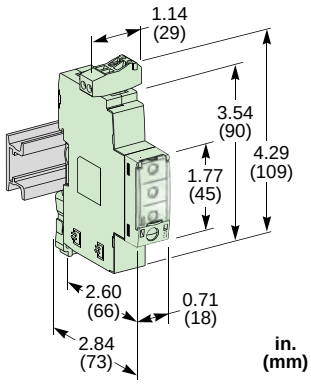
Delay Unit for MN Release



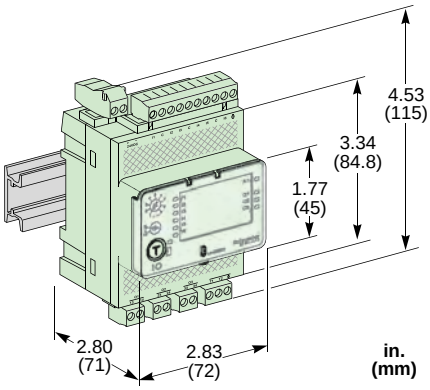
IFE - Ethernet Interface



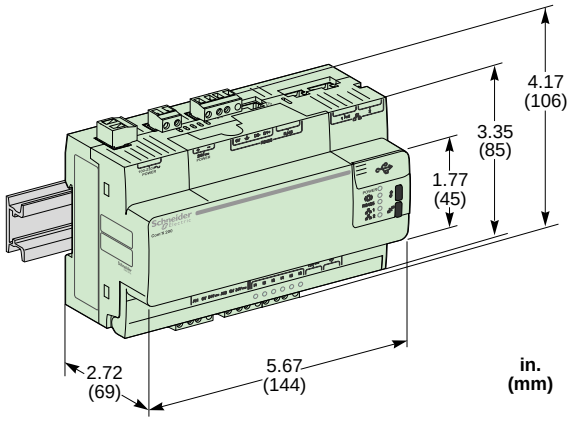
IFM - Modbus SL (RTU) Interface



IO (Input/Output) Application Module

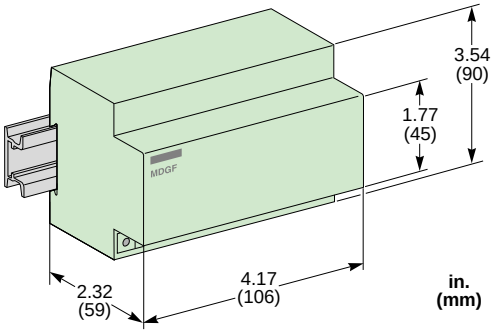


Com'X 210

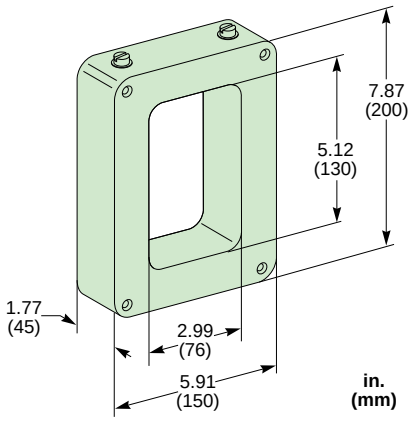


Components for Source Ground-Return (SGR) Protection

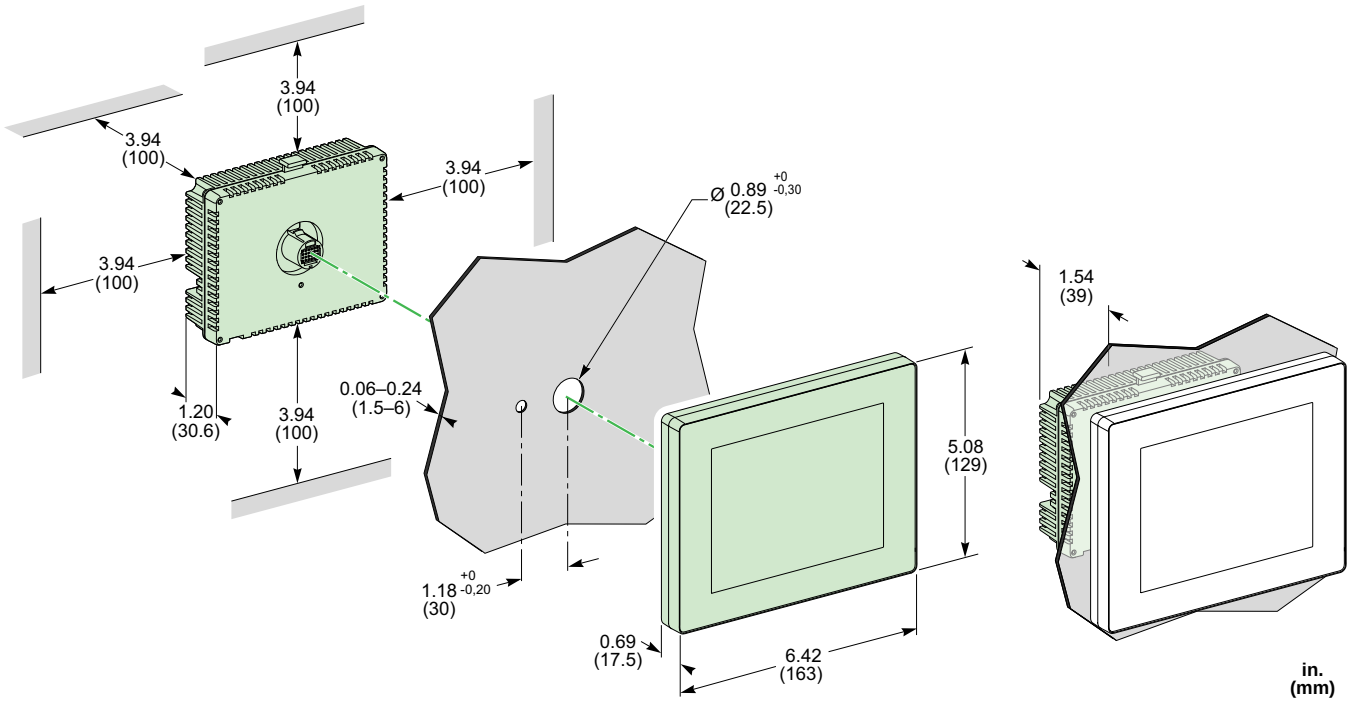
MGDF Module



Sensor

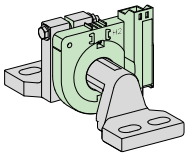


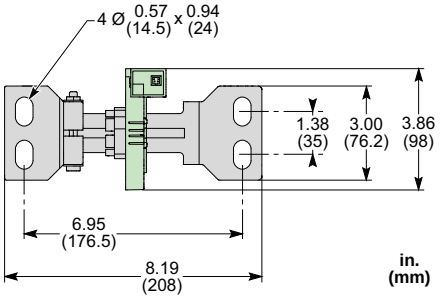
FDM128


3.94
(100)
3.94
(100)
3.94
(100)
3.94
(100)
3.94
(100)
Ø 0.89 +0 -0,30
(22.5)
1.20
(30.6)
0.06–0.24
(1.5–6)
1.18 +0 -0,20
(30)
0.69
(17.5)
6.42
(163)
5.08
(129)
1.54
(39)
in.
(mm)

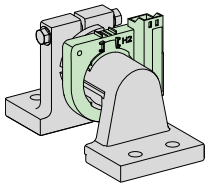
External Neutral Current Sensor

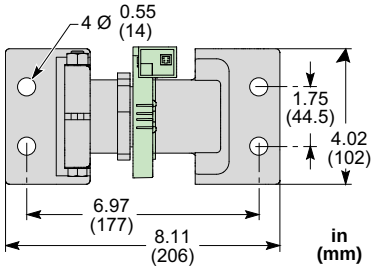
400/1600 A
(MTZ1 06 to MTZ1 16)



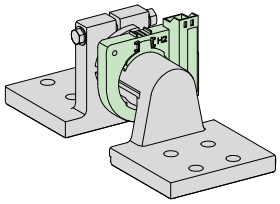


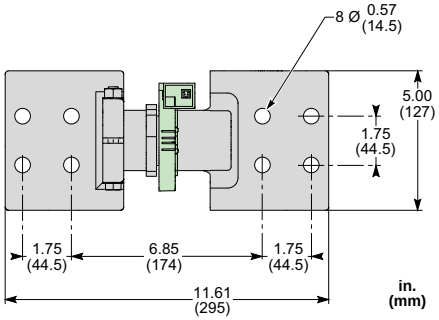
400/2000 A
(MTZ2 08 to MTZ2 20)



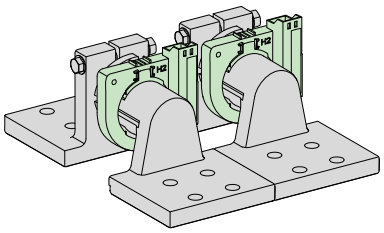


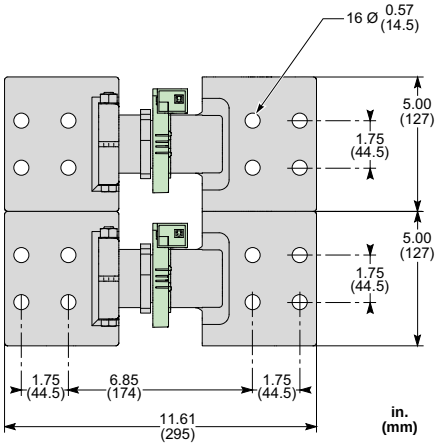
1000/4000 A
(MTZ2 25 to MTZ2 40)



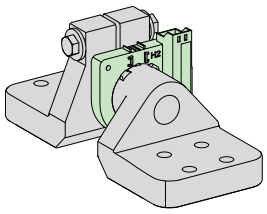


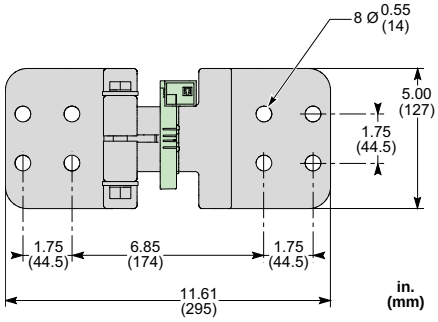
4000/6300 A
(MTZ3 40 to MTZ3 63)



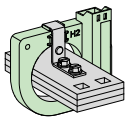


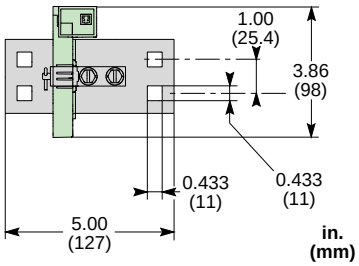
2000/6300 A
(MTZ2 to MTZ3)
Single Sensor Kit



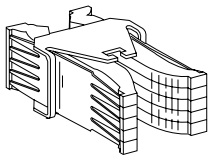


2000/6300 A
(MTZ2 to MTZ3)
3 Layer Bus





MasterPacT MTZ Clusters



Number of Clusters Per Pole Required for MasterPacT MTZ1 Devices	
Device	**MTZ1**
630 A	6
800 A	6
1000 A	6
1250 A	6
1600 A	6

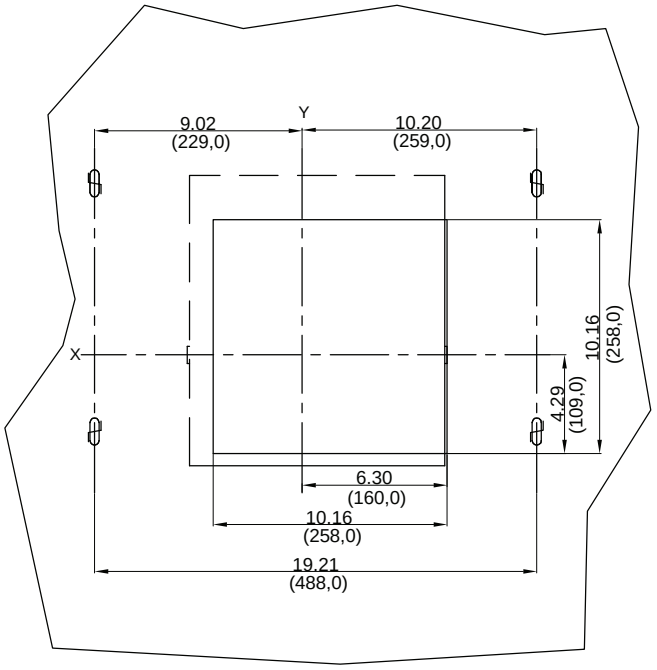
Number of Clusters Per Pole Required for MasterPacT MTZ2/MTZ3 Devices						
Device	**MasterPacT MTZ2-3 3P**					
	N / N1	**H1**	**HA**	**H / H2 / HF**	**H3**	**L / L1 / LF / L1F / HB / HC**
MTZ2 08	2	4	4	4	6	8
MTZ2 12	2	—	—	4	4	8
MTZ2 16	6	6	6	6	6	8
MTZ2 20	8	8	8	8	8	16
MTZ2 25 to 30	—	—	—	16	16	16
MTZ2 32	—	16	16	16	16	24
MTZ3 40 to 50	—	—	24	24	24	24
MTZ3 60	—	—	—	24	24	24

MasterPacT MTZ Enclosure Cutouts

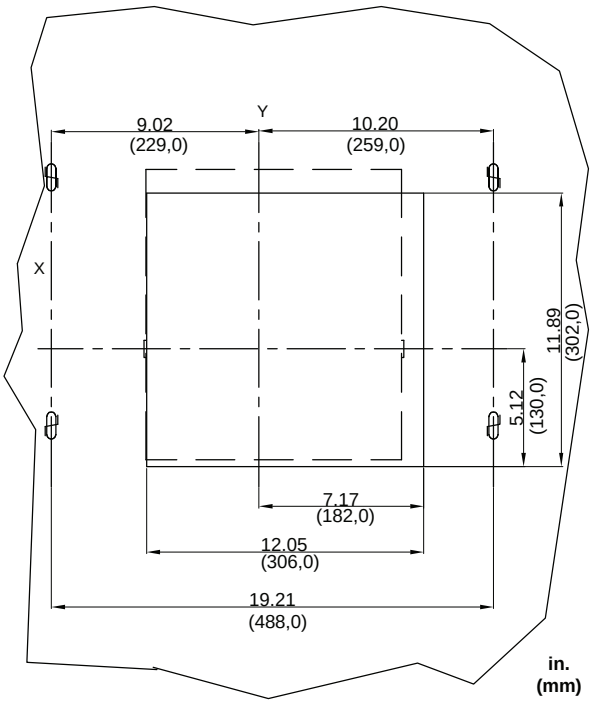
MasterPacT MTZ1 Door Cutout Dimensions

MasterPacT MTZ1 Three-Pole Drawout UL/ANSI Door Cutout

Without Door Frame



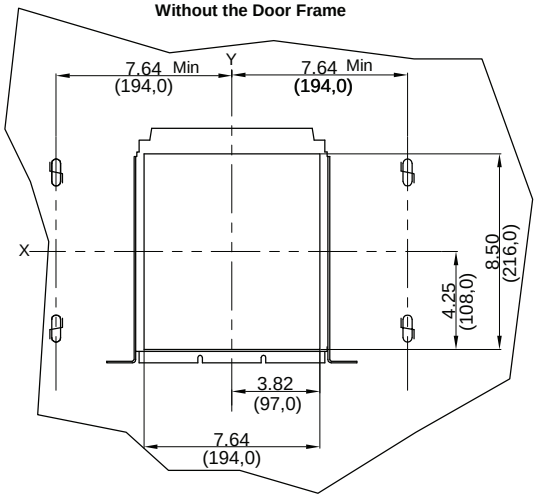
With Door Frame



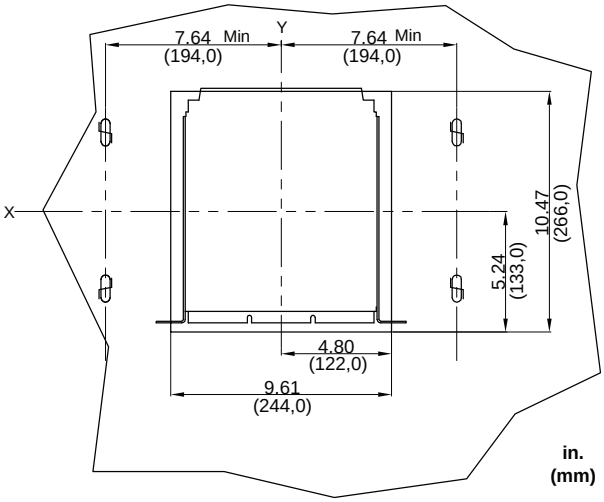
in.
(mm)

MasterPacT MTZ1 Three-Pole Fixed UL/ANSI Door Cutout Dimensions

Without the Door Frame



With the Door Frame

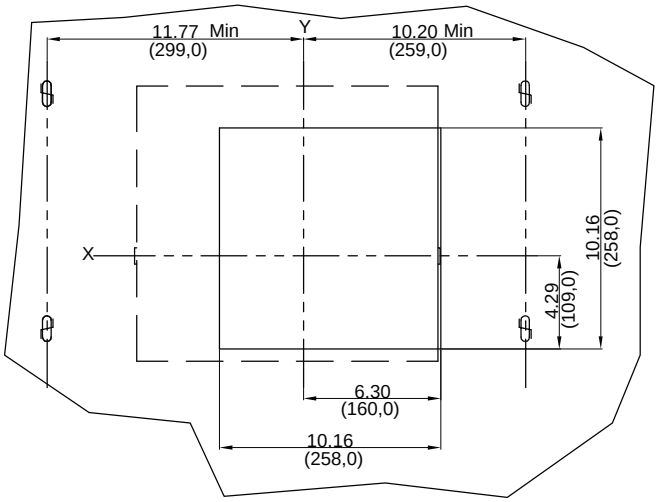


in.
(mm)

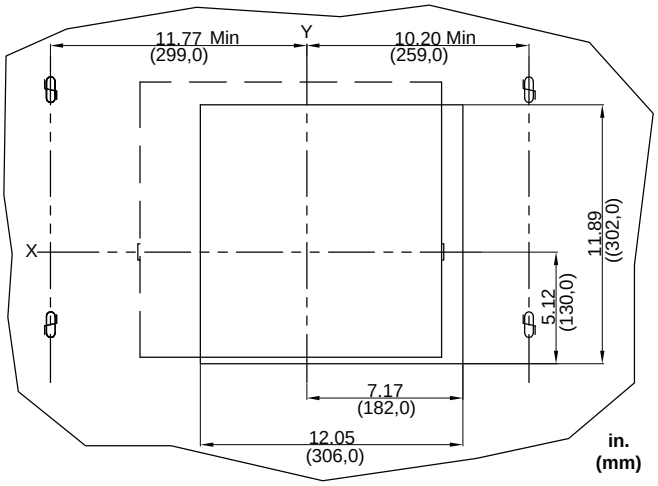
MasterPacT MTZ1 Door Cutout Dimensions (Continued)

MasterPacT MTZ1 Four-Pole Drawout UL/ANSI Door Cutout

Without Door Frame



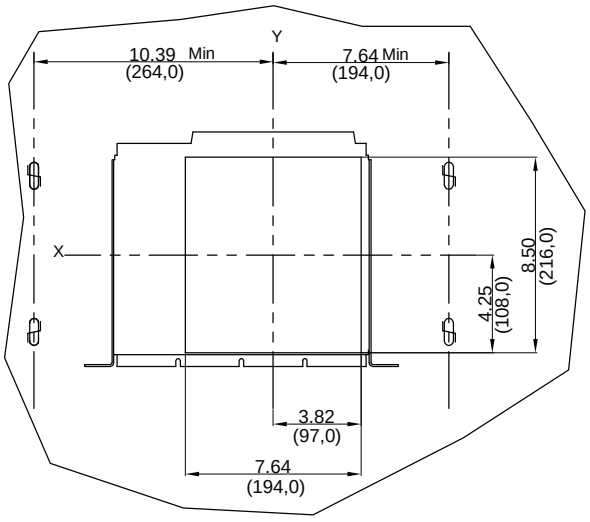
With Door Frame



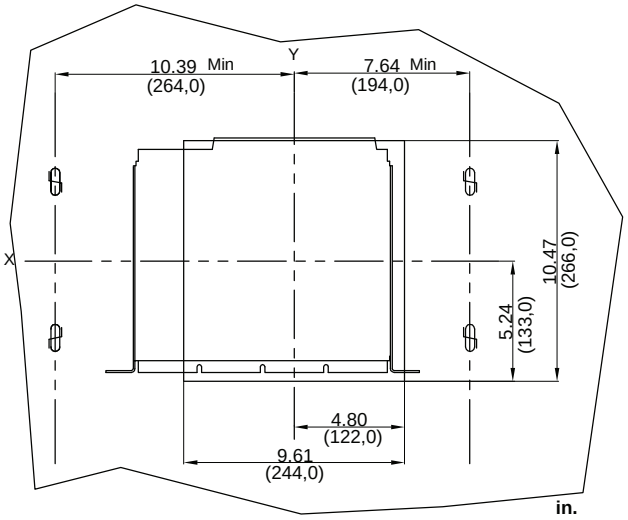
in.
(mm)

MasterPacT MTZ1 Four-Pole Fixed UL/ANSI Door Cutout

Without the door frame



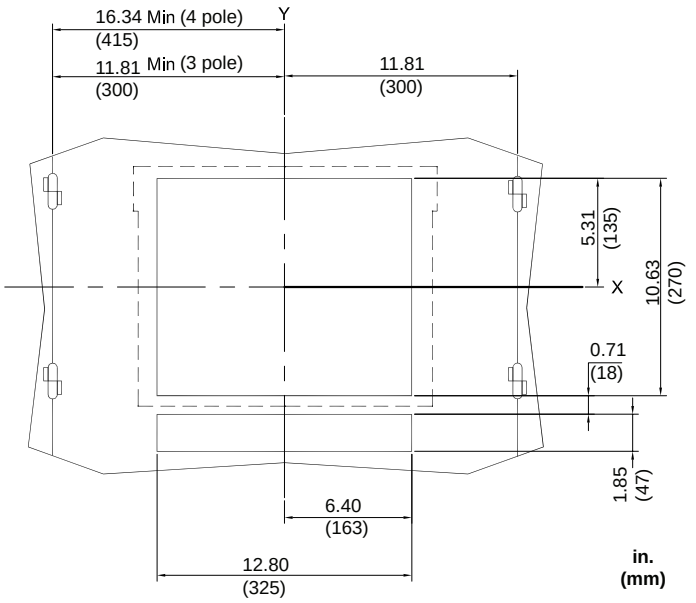
With the door frame



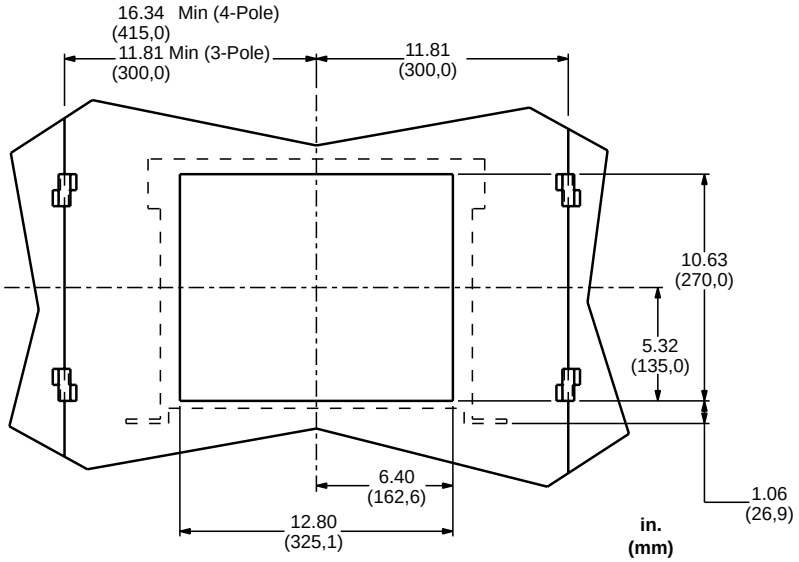
in.
(mm)

MasterPacT MTZ2 Door Cutout Dimensions

MasterPacT MTZ2 Three-Pole and Four-Pole Drawout UL/ANSI Door Cutout

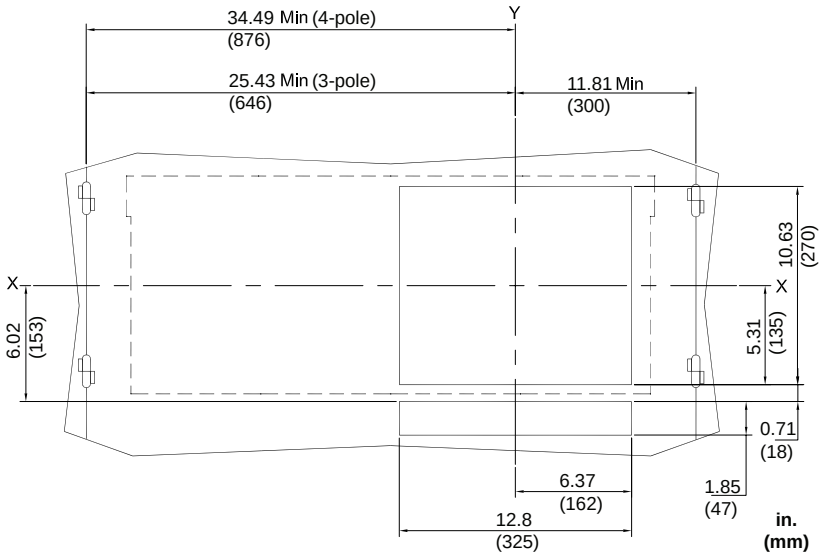


MasterPacT MTZ2 Three-Pole and Four-Pole Fixed UL/ANSI Door Cutout Dimensions

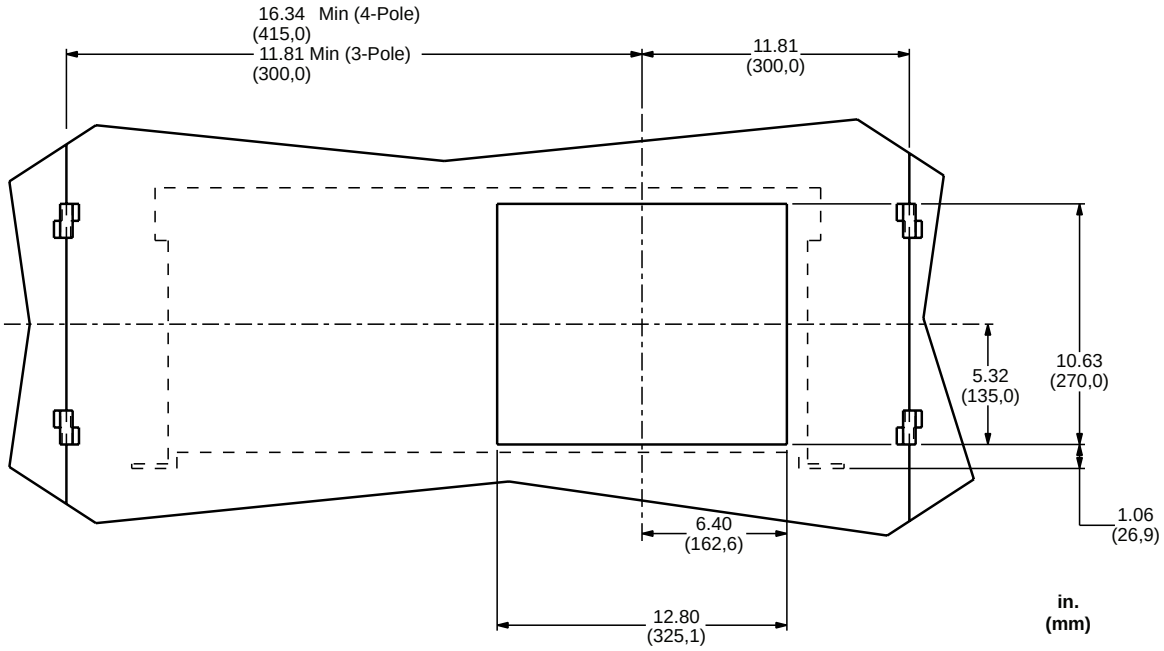


MasterPacT MTZ3 Door Cutout Dimensions

MasterPacT MTZ3 Three-Pole and Four-Pole Drawout UL/ANSI Door Cutout



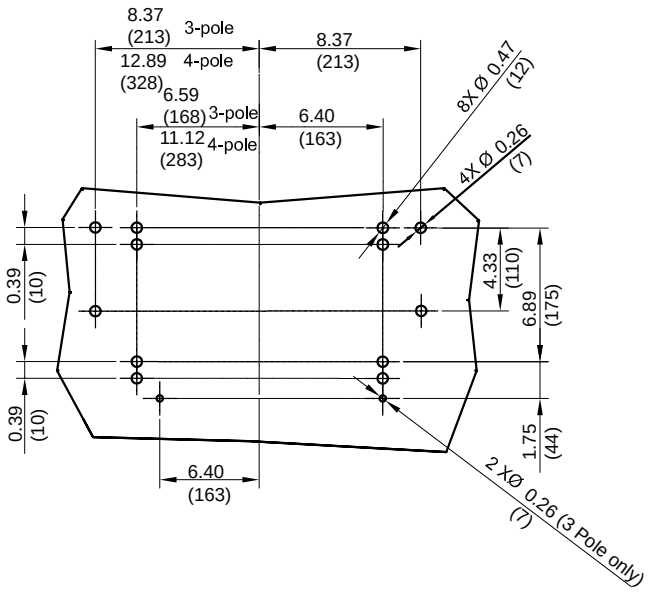
MasterPacT MTZ3 Three-Pole and Four-Pole Fixed UL/ANSI Door Cutout Dimensions



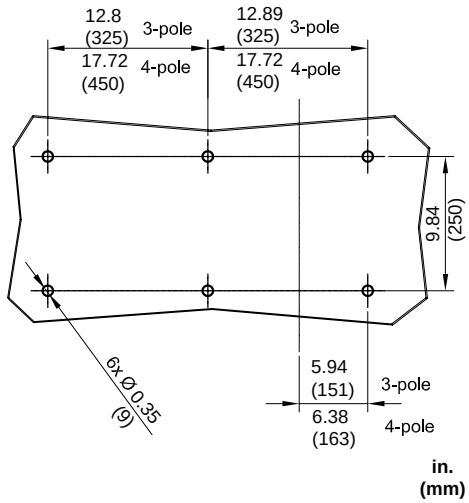
MasterPacT MTZ2/MTZ3 Mounting

Drawout Cradle Mounting

800-3000 A and 3200 A H1 and H2 Cradle



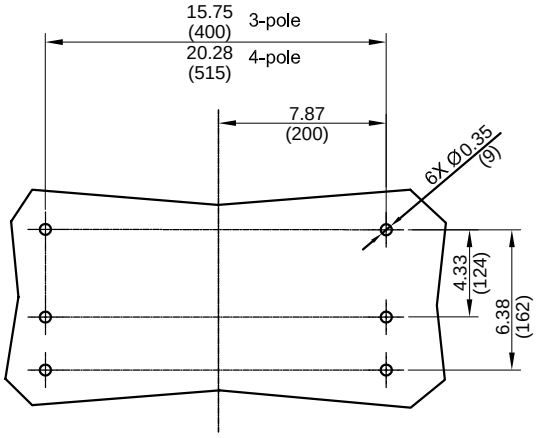
3200 A L1 and 4000-6000 A Cradle



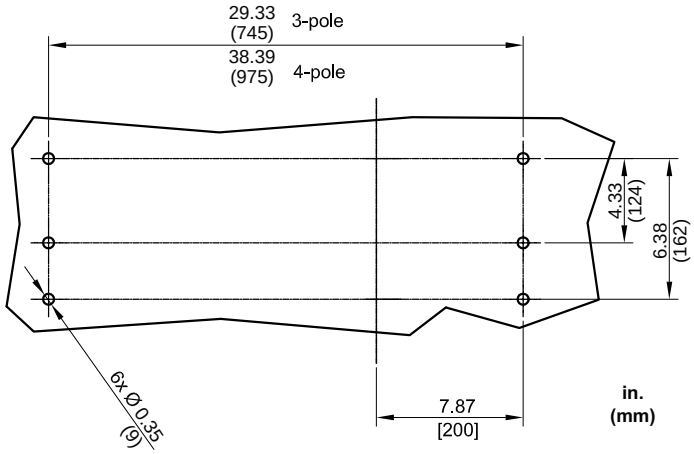
in.
(mm)

Fixed Circuit Breaker Mounting

800–3000 A Fixed Circuit Breaker



4000-6000 A Fixed Circuit Breaker



in.
(mm)

MasterPacT MTZ Shipping Weights

MasterPacT MTZ1 Shipping Weights

Shipping Weights											
Circuit Breaker		Circuit Breaker (lb/kg)		Cradle (lb/kg)		Connector Type and Weight (lb/kg)			Pallet (lb/kg)	Total Weight (lb/kg)	
Type	Rating (A)	3P	4P	3P	4P	Type	3P	4P		3P	4P
Drawout	800	40/18	52/24	36/16	43/20	FCF	15/7	20/9	10/5	101/46	125/58
	1200					RCTH or RCTV	6/3	8/4	10/5	92/42	113/53
Fixed	800	40/18	52/24	—	—	FCF	15/7	20/9	10/5	65/30	82/38
	1200					RCTH or RCTV	6/3	8/4	10/5	56/26	70/33
	1600	40/18	52/24	—	—	RCTV	18/8	20/9	10/5	68/31	82/38

MasterPacT MTZ2 Shipping Weights

Shipping Weights											
Circuit Breaker		Circuit Breaker (lb/kg)		Cradle (lb/kg)		Connector Type and Weight (lb/kg)			Pallet (lb/kg)	Total Weight (lb/kg)	
Type	Rating (A)	3P	4P	3P	4P	Type	3P	4P		3P	4P
Drawout	800	109/50	142/65	97/44	116/53	FCF	42/19	55/25	17/8	265/121	320/151
	1600					FCT	84/38	109/50	17/8	307/140	384/176
	2000					RCTH RCTV	17/8	22/10	17/8	240/110	297/136
	2500	127/58	165/75	124/57	149/68	FCT	80/36	104/47	17/8	348/159	435/198
	3000					RCTH RCTV	26/12	34/15	17/8	294/135	365/166
	2000 (L1, L1F)	127/58	165/75	124/57	149/68	RCOV (standard)	100/46	130/59	17/8	368/169	461/210
	3200 (H1, H2, H3)					RCOV (ArcBlok)	153/69	NA	17/8	421/191	NA
	4000 W-Frame (H1, H2, H3)					RCOV (special)	115/52	145/66	17/8	259/118	327/149
Fixed	800	109/50	142/65	—	—	FCF	42/19	55/25	17/8	168/77	204/98
	1600					FCT	84/38	109/50	17/8	210/96	368/123
	2000					RCTH RCTV	17/8	22/10	17/8	143/66	181/83
	2500	127/58	165/75	—	—	FCT	80/36	104/47	17/8	224/102	286/130
	3000					RCTH RCTV	26/12	34/15	17/8	170/78	216/98
	2000 (L1, L1F)	127/58	165/75	—	—	RCOV (standard	100/46	130/59	17/8	244/112	265/142
	3200 (H1, H2, H3)					RCOV (ArcBlok)	153/69	NA	17/8	297/134	NA
	4000 W-Frame (H1, H2, H3)					RCOV (special)	115/52	145/66	17/8	135/61	178/81

MasterPacT MTZ3 Shipping Weights

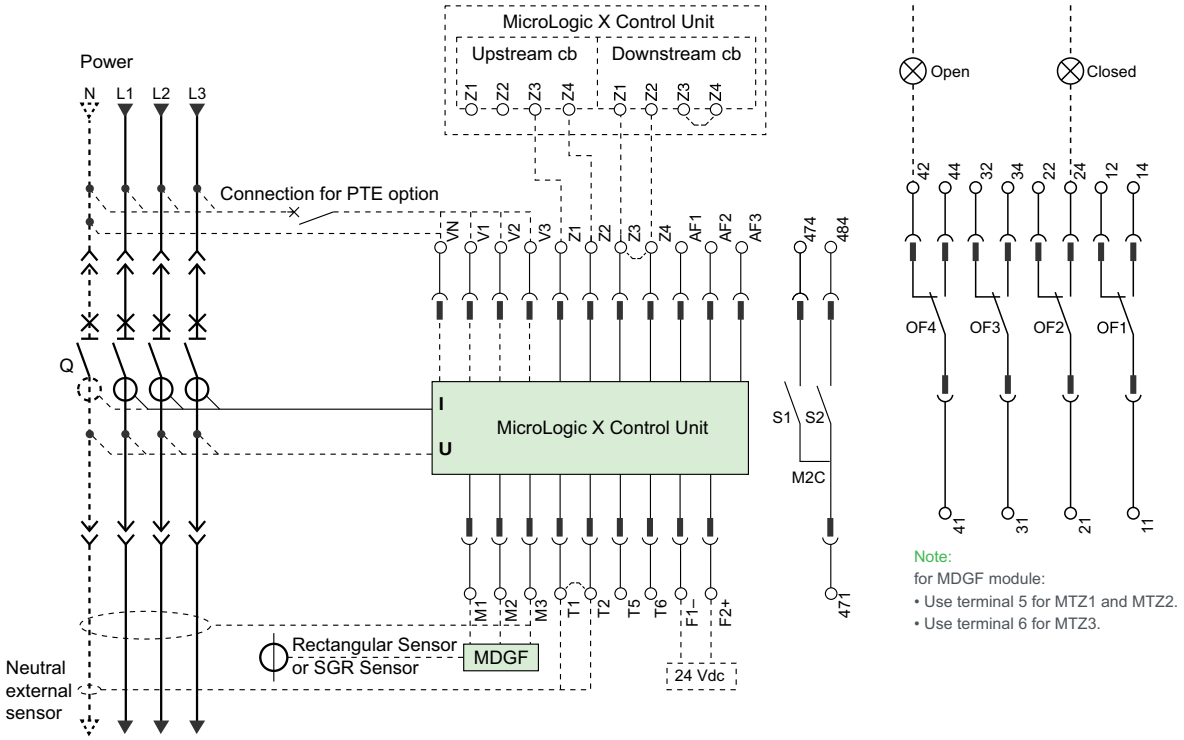
Shipping Weights											
Circuit Breaker		Circuit Breaker (lb/kg)		Cradle (lb/kg)		Connector Type and Weight (lb/kg)			Pallet (lb/kg)	Total Weight (lb/kg)	
Type	Rating (A)	3P	4P	3P	4P	Type	3P	4P		3P	4P
Drawout	3200 (L1) 4000	227/103	295/134	278/126	334/152	FCF	84/38	109/50	39/18	628/285	777/354
						FCT	168/77	218/99	39/18	712/324	886/403
						RCTH RCTV	52/24	68/31	39/18	596/271	736/335
	5000	227/103	295/134	278/126	334/152	FCT	168/77	218/99	39/18	712/324	886/403
						RCTH RCTV	52/24	68/31	39/18	596/271	736/335
	6000	227/103	295/134	278/126	334/152	RCTH or RCTV	396/180	528/240	39/18	940/427	1196/544
Fixed	3200 (L1) 4000	227/103	295/134	—	—	FCF	84/38	109/50	39/18	350/159	443/202
						FCT	168/77	218/99	39/18	634/198	552/251
						RCTH RCTV	52/24	68/31	39/18	318/145	402/183
	5000	227/103	295/134	—	—	FCT	168/77	218/99	39/18	434/198	552/251
						RCTH RCTV	52/24	68/31	39/18	318/145	402/183
	6000	227/103	295/134	—	—	RCTH RCTV	396/180	528/240	39/18	662/301	862/392

MasterPacT MTZ Circuit Breaker Electrical Diagrams

MasterPacT MTZ1 Fixed and Drawout Devices

The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

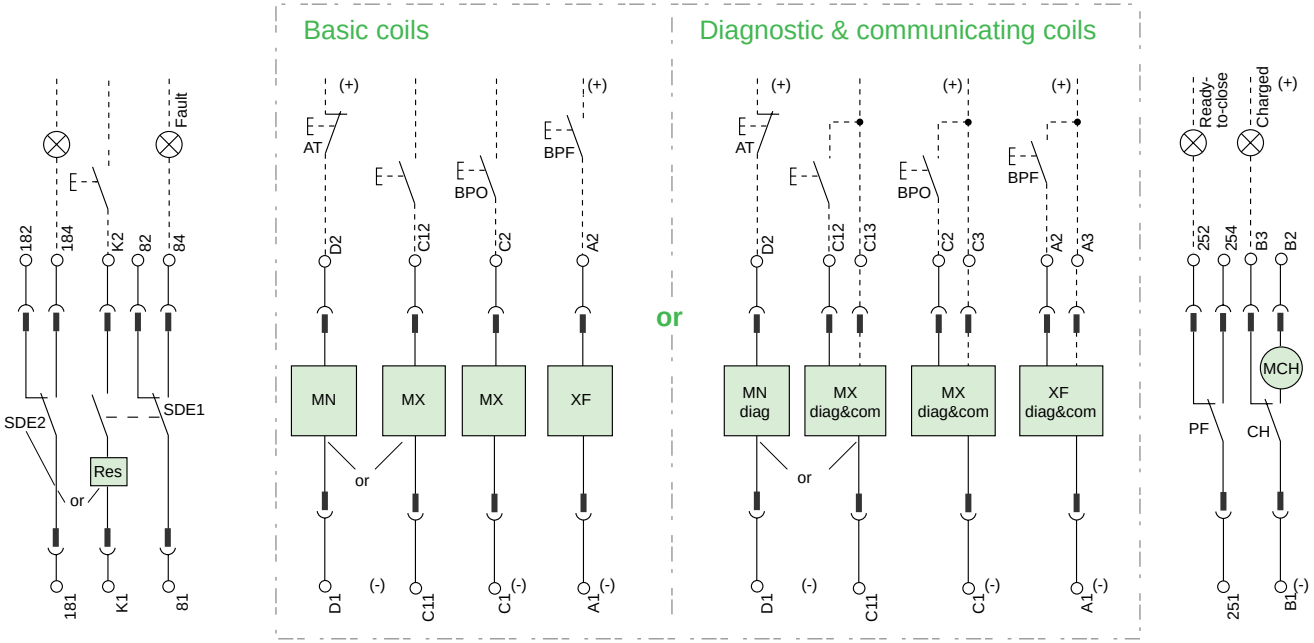
Power[56] **Control Unit** **Indication Contacts**



NOTE: It is possible to add a second MX/MX diag&com or a MN/MN diag voltage release. The second MX diag&com voltage release can only be installed after the delivery of the circuit breaker. This is an after-sales adaptation.

56. For a three-pole MasterPacT MTZ circuit breaker in a power system with neutral distributed, the neutral must be connected to the Vn terminal of the MicroLogic X control unit and the ENVT configured to "Yes" to maintain the quality of power measurement.

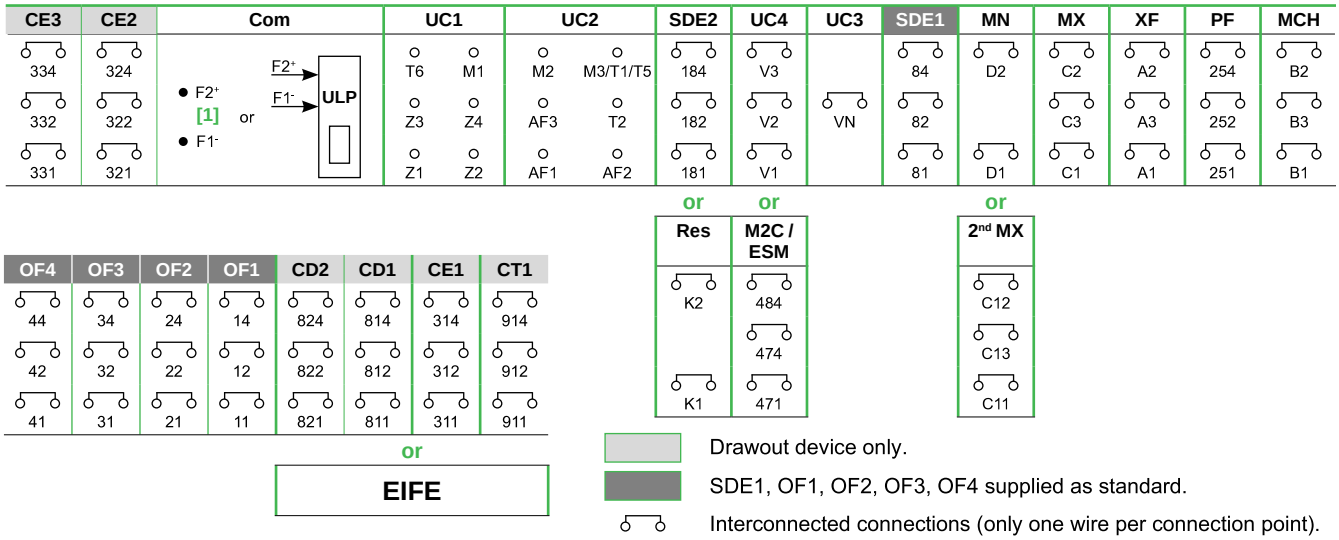
Remote Operation[57]



NOTE: Maximum length of the two wires between A2–A3,/C20C3/C12/C13: 5 m (16 ft.).
For the maximum length of the wiring between the AC/DC power supply and the voltage release terminals A1–A3/C1–C3/C11–C13/D1–D2: see Shunt Close (XF), Shunt Trip (MX), and Undervoltage Release (MN) with Basic Coils, page 89.

57. Possibe to add a second MX/MX diag&com or a MN/MN diag coil.

Terminal Block Marking



[1] The connection of the +/- of the power supply either on terminals F2/F1 or on the +/- terminals of the ULP port must be strictly respected. Crossing the polarities may damage the device.

Indication Contacts Terminal Bock

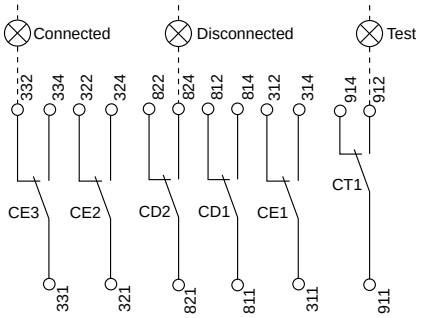
OF4 / OF3 / OF2 / OF1 : Open/closed indication contacts OF

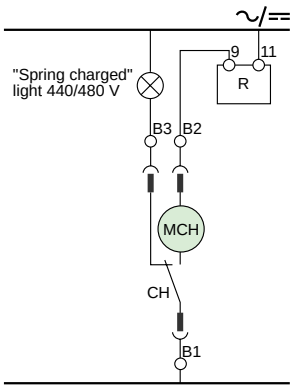
Cradle Contacts Terminal Block

CD2 / CD1: Disconnected position contacts

CE3 /CE2 / CE1: Connected position contacts

CT1: Test position contacts





Control Unit Terminal Block

Com : ULP Communication

UC1 : Z1-Z4 Zone Selective Interlocking
M1 = MDGF module input

UC2 : T1, T2 = Neutral External Sensors
M2, M3 = MDGF Module Input

UC3 : Voltage Connector (must be connected to the neutral with a 3P circuit breaker)

UC4 : External Voltage Connector (PTE option)
or
M2C : 2 Programmable Contacts (external relay) ext. 24 Vdc power supply required is not installed.

Remote Operation Terminal Block

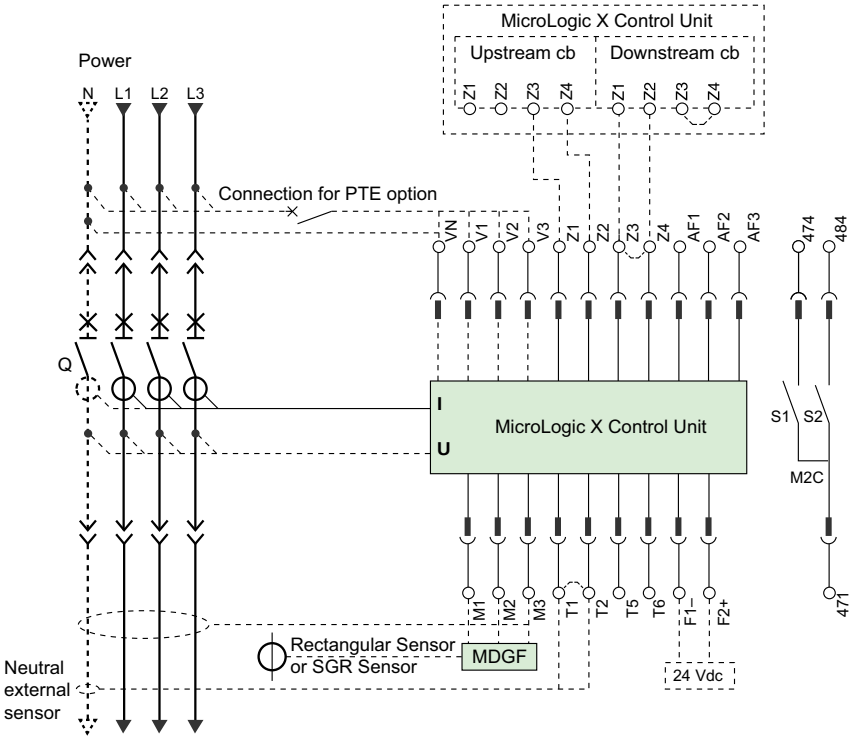
SDE2: or **Res:** remote reset	Overcurrent Trip Indication Contact Remote Reset
SDE1:	Overcurrent Trip Indication Contact (supplied as standard)
MN /MN diag:	Undervoltage Release Standard or Diagnostic
MX/MX diag&com:	Shunt Trip Standard or Diagnostic & Communicating
2nd MX/MX diag&com:	Shunt Trip Standard or Diagnostic
XF/XF diag&com:	Shunt Close Standard or Diagnostic & Communicating
PF:	Ready-to-Close Contact
MCH:	Spring Charging Motor

NOTE: When communicating MX diag&com or XF diag&com accessories are used, the third wire (C3,A3, C13) must be connected even if the communication module is not installed.

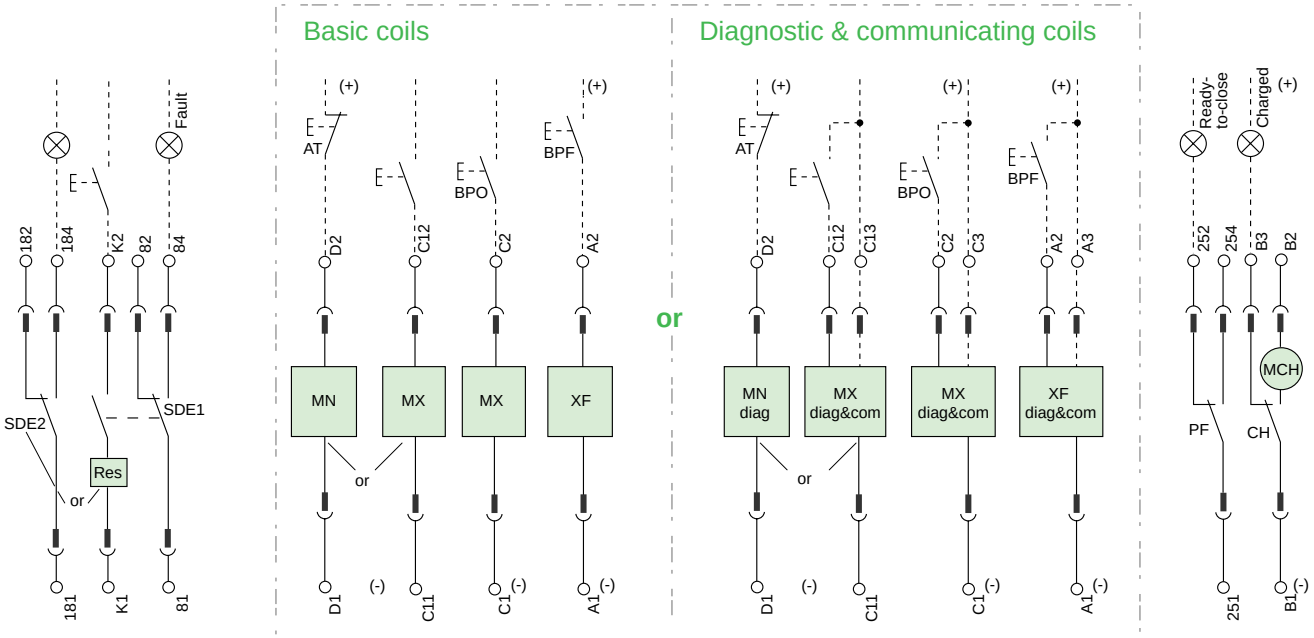
MasterPacT MTZ2/MTZ3 Fixed and Drawout Devices

The diagram is shown with circuits de-energized, all devices open, connected and charged and relays in normal position.

Power [58] **Control Unit**

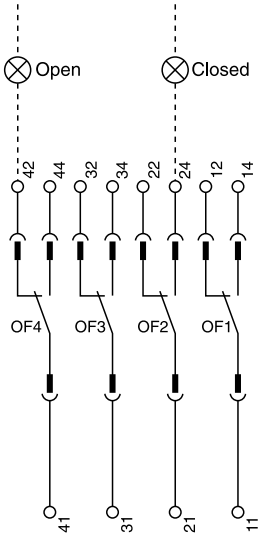


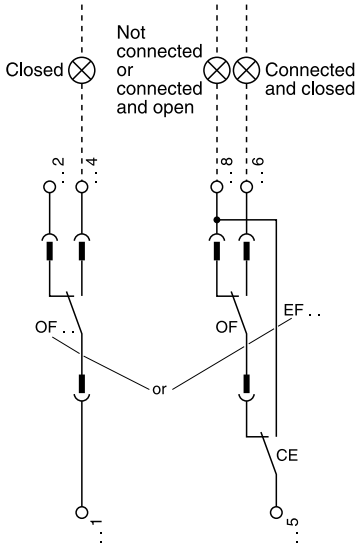
Remote Operation[59]



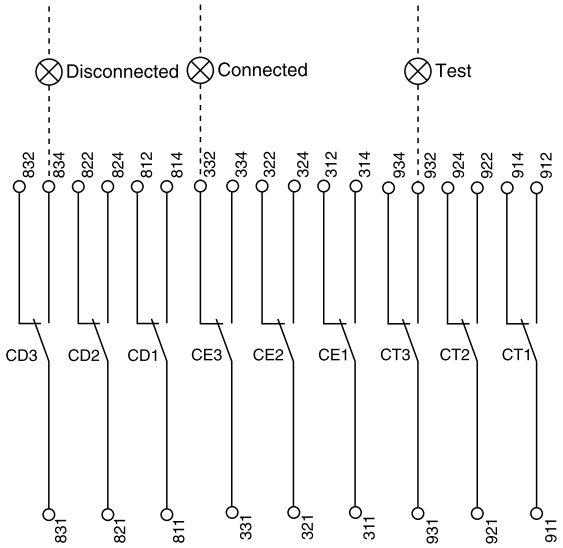
58. For a three-pole MasterPacT MTZ circuit breaker in a power system with neutral distributed, the neutral must be connected to the Vn terminal of the MicroLogic X control unit and the ENVT configured to "Yes" to maintain the quality of power measurement.
59. It is possibe to add a second MX/MX diag&com or an MN/MN diag coil.

Indication Contacts





Cradle Contacts



Control Unit Terminal Block

Com : ULP communication

UC1 : Z1-Z4 Zone Selective Interlocking
M1 = MDGF module input

UC2 : T1, T2 = Neutral External Sensors
M2, M3 = MDGF module input ext. 24 Vdc power supply required

UC3 : Voltage Connector (must be connected to the neutral with a 3P circuit breaker)

UC4 : External Voltage Connector (PTE option)
or
M2C : 2 Programmable Contacts (external relay)

Remote Operation Terminal Block

SDE2: Overcurrent trip indication contact
or
Res: Remote Reset

SDE1: Overcurrent Trip Indication Contact (Supplied as Standard)

MN /MN diag: Undervoltage Release Standard or Diagnostic

MX/MX diag&com: Shunt Trip Standard or Diagnostic & Communicating

2nd MX/MX diag&com: Shunt Trip Standard or Diagnostic

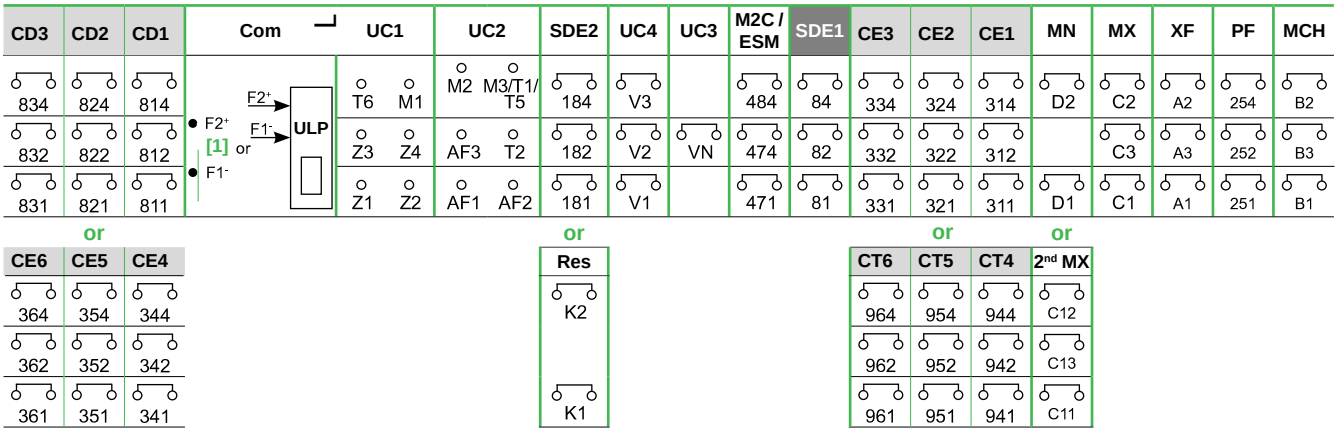
XF/XF diag&com: Shunt Close Standard or Diagnostic & Communicating

PF: Ready-to-Close Contact

MCH: Spring Charging Motor

NOTE: When communicating MX com or XF com accessories are used, the third wire (C3,A3, C13) must be connected even if the communication module is not installed.

Terminal Block Marking



Drawout device only.

SDE1, OF1, OF2, OF3, OF4 supplied as standard.

Interconnected connections (only one wire per connection point).

[1] The connection of the +/- of the power supply either on terminals F2/F1 or on the +/- terminals of the ULP port must be strictly respected. Crossing the polarities may damage the device.

MasterPacT MTZ Integration in Source-Changeover Systems

Source-Changeover Systems Mechanical Interlocking

Schneider Electric offers source changeover systems based on MasterPacT MTZ devices.

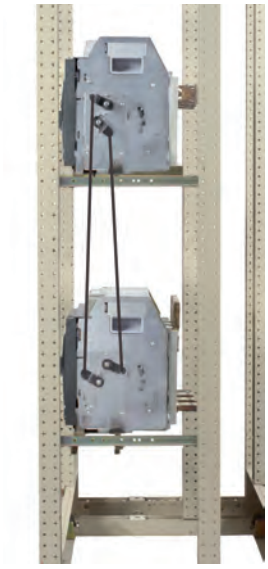
They are made of up to three circuit breakers or switches linked by an electrical interlocking system that may have different configurations. A mechanical interlocking system must be added for additional protection against electrical problems or incorrect manual operations. In addition, a controller can be used for automatically control the source transfer.

For implementing the mechanical interlocking two different possibilities are offered:

- interlocking with rods
- interlocking with cables

The following pages present the different solutions for mechanical and electrical interlocking and associated controllers.

Interlocking Two Devices Using Connecting Rods



Interlocking of two MasterPacT MTZ2 or MTZ3 circuit breakers using connecting rods

The two devices must be installed one above the other.

Available only for MasterPacT MTZ2 and MTZ3 devices, all mixed associations between fixed type and drawout type devices are possible.

Installation

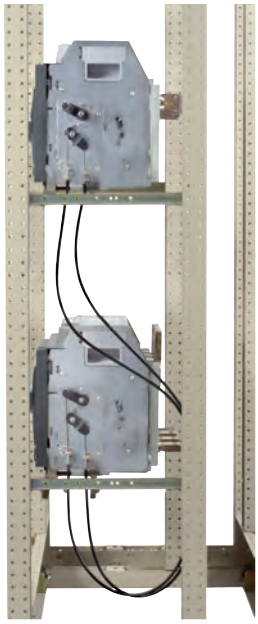
This function requires:

- An adaptation fixture on the right side of each circuit breaker or switch.
- A set of connecting rods with no-slip adjustments.
- A mechanical operation counter CDM (required).

The adaptation fixtures, connecting rods, circuit breakers and switches are supplied separately, ready for assembly by the customer.

The maximum vertical distance between the fixing plates is 900 mm (35.4 in.).

Interlocking of Two or Three Devices Using Cables



Interlocking of two MasterPacT circuit breakers using cables

For cable interlocking, the circuit breakers can be installed either one above the other or side-by-side.

All mixed associations between MasterPacT MTZ2 and MTZ3 fixed and drawout type devices are possible.

Interlocking between two MasterPacT MTZ2 devices

This function requires:

- An adaptation fixture on the right side of each device.
- A set of cables without slip adjustments.
- A mechanical operation counter CDM (required).

The maximum distance between the fixing planes (vertical or horizontal) is 2000 mm (78.7 in.).

Interlocking between three MasterPacT MTZ devices.

This function requires:

- A specific adaptation fixture installed on the right side of each device.
- Two sets of cables without slip adjustments.
- A mechanical operation counter CDM (required).

The maximum distance between the fixing planes (vertical or horizontal) is 1000 mm (39.4 in.).

Installation

The adaptation fixtures, sets of cables and circuit breakers or switches are supplied separately, ready for assembly by the customer.

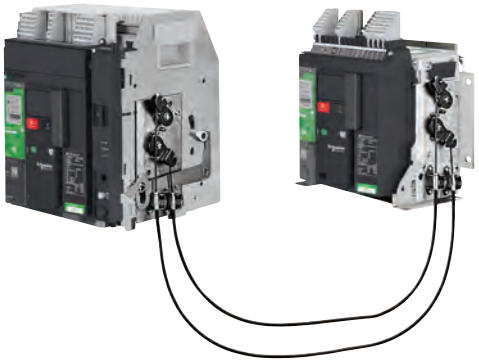
Installation conditions for cable interlocking systems:

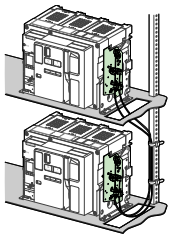
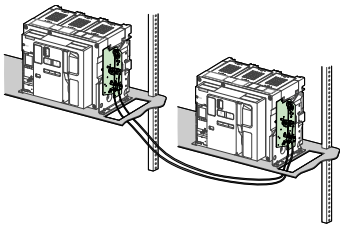
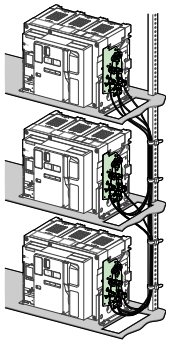
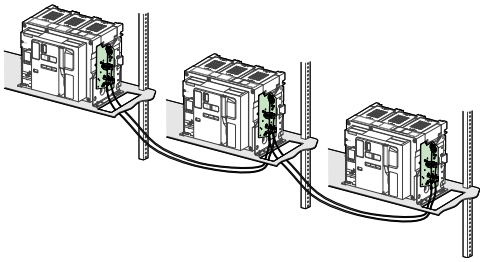
- Cable length: 2.5 m (8.2 ft.)
- Cable bending radius: greater than 100 mm (3.94 in.)
- Maximum number of curves: three

NOTE: For cable length higher than 2.5 m (8.2 ft.) please consult Schneider Electric before ordering the circuit breakers for a customized solution.

MasterPacT MTZ Mechanical Interlocking by Cables

All mixed associations between MasterPacT MTZ2 and MTZ3 fixed and drawout type devices are possible.



Cable Interlocking	
Vertical	**Horizontal**
Two devices MTZ2 - MTZ3	
	
Three devices MTZ2 - MTZ3	
	

MasterPacT MTZ Services

MasterPacT MTZ Services Overview

Schneider Electric services provide life cycle support for all installations with MasterPacT MTZ devices.

Electrical distribution equipment lies at the heart of the Industry business, powering the machines and key processes. Circuit breakers with associated protection relays and trip units help maintain continuity of power and protect cables. When there is a problem, the businesses must respond immediately.

Implementing an effective services strategy for electrical distribution installations is crucial for business. Schneider Electric services help:

- Reduce unscheduled downtimes.
- Increase reliability.
- Improve equipment.

Experienced engineers and qualified field service representatives are committed to provide innovative solutions, best-in-class customer service, and advanced technical support.

Schneider Electric Field Services helps a business manage its electrical distribution equipment all along its life cycle.

MasterPacT MTZ Associated Services

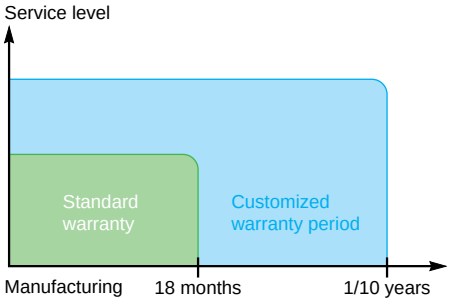
Assistance with Commissioning and Start Up

Have Schneider Electric expertise available by using Associated Services.

Schneider Electric assistance and supervision of commissioning and start-up provide secure and optimal installation of electrical installation. The proposed services are performed by experts and highly skilled personnel who apply manufacturer procedures:

- Check product commissioning in accordance with manufacturer procedures
- Validation of mechanical functions before operation
- Setting of protection functions based on data provided by end user
- Start-up assistance and testing
- Schneider Electric compliance certificate

Warranty Extension



With the Schneider Electric Warranty extension, you can be certain that in the case of an unanticipated event, your product will be repaired or replaced quickly, minimizing downtime.

Two options are offered to meet your business requirements and criticality of your installation:

- 1 to 10-year full extended warranty
- Upgrade extended warranty to include in-and-out parts removal and installation for 3% of purchase price per year.

The full Warranty is applicable when the product is installed, maintained, and operated following Schneider Electric product recommendations.

MasterPacT MTZ Digital Services

Asset Condition Monitoring with MasterPacT MTZ Devices

Asset condition monitoring optimizes maintenance costs and reduces the risk of unscheduled downtime. It offers maintenance analysis and recommendations based on data and events available through MicroLogic and optional digital modules (see Overview of MicroLogic X Control Unit, page 17).

These recommendations are delivered in a Service Request format with actionable maintenance information: which asset? what to perform? relevant skills/ tools/spare parts to perform to perform appropriate maintenance with timeframe..

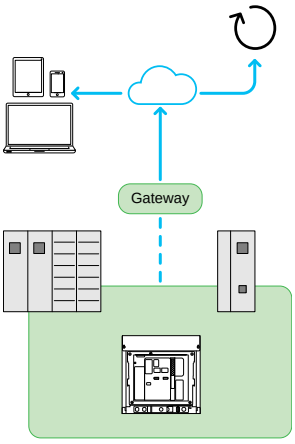
Once the MasterPacT MTZ is connected, Schneider Electric continously retrieves data from equipment in order to analyze the health status of the circuit breaker and provide recommendations for scheduling maintenance tasks.

Privileged access to Schneider Electric remote technical support is also available.

Integration of service requests into the IT landscape (BMS-Building management System, EAM-Enterprise Asset management, maintenance software...) is also available as an optional feature.

Asset condition monitoring can be included in Schneider Electric Service plans.

Asset and Alarm Management with MasterPacT MTZ Devices



Asset Management

With enhanced data measurements as well as events/alarms functions embedded into the device, MasterPacT MTZ, with a native communication function is a relevant, attribute to leverage an asset management solution.

Alarm Management

Schneider Electric helps improve facility operation management through early detection, notification and actions of any event on a MasterPacT MTZ circuit breakers and associated MicroLogic X control unit.

Experts are available to provide remote and on-site maintenance actions (preventive and corrective).

With alarm management services, Schneider Electric is permanently, remotely, and securely connected to analyze data, events and alarms coming from equipment.

Alarm management can be included in Schneider Electric Advantage Service plans.

Energy Efficiency and Power Quality Management

MasterPacT MTZ embeds specific measurements related to Energy Efficiency & Power Quality Management.

Specific Services are offered to optimize energy costs, asset utilization and facility operations:

- Detection of abnormal consumptions and parameters.
- Event management and performance follow-up.
- Expert analysis and recommendations through monthly reporting.
- Benchmarking when multiple sites are managed.

Schneider Electric's expertise provides practical data and recommendations through periodic reporting that empowers you to take the right actions.

Energy Efficiency & Power Quality management can be included in Schneider Electric Service plans.

EcoStruxure Facility Expert

EcoStruxure Facility Expert optimizes operations and maintenance, maintains business continuity, and provides insight to service providers or facility managers.

Providing real-time collaborative technology on mobile devices or PCs, EcoStruxure Facility Expert is made for site managers and on-field technicians connected to buildings and equipment and involves very simple information sharing between all users.

Register and view the asset's status

QR code ready, Schneider Electric devices are already configured to communicate with EcoStruxure Facility Expert in a simple way and enable automatic download of ID, technical documentation and maintenance plan.

Located on the map, visualize all assets in real time, navigate and filter by area or status.

Improve Maintenance and Operations

Providing relevant information on critical assets, sending instant and documented alarms EcoStruxure Facility Expert allows users to diagnose remotely in case of issues and manage maintenance efficiently.

- Instant alarms on threshold and status change.
- Maintenance plan, asset log history, asset doc repository.
- Real-time assets status and map localization.
- Task manager and task reminder.
- One click to edit intervention and activity reports including voice memos, notes, photos and measurements.
- Remain connected, comment, share information, and get support in the field from colleagues or experts if needed.

Schneider Electric local partners are trained and certified to sell, install, and commission EcoStruxure Facility Expert. They can also operate the solution if the site manager wants to delegate the task.

Download the free version of EcoStruxure Facility Expert

Ordering MasterPacT MTZ Devices

We are expanding our digital tools to simplify and expedite the ordering of MasterPacT MTZ devices:

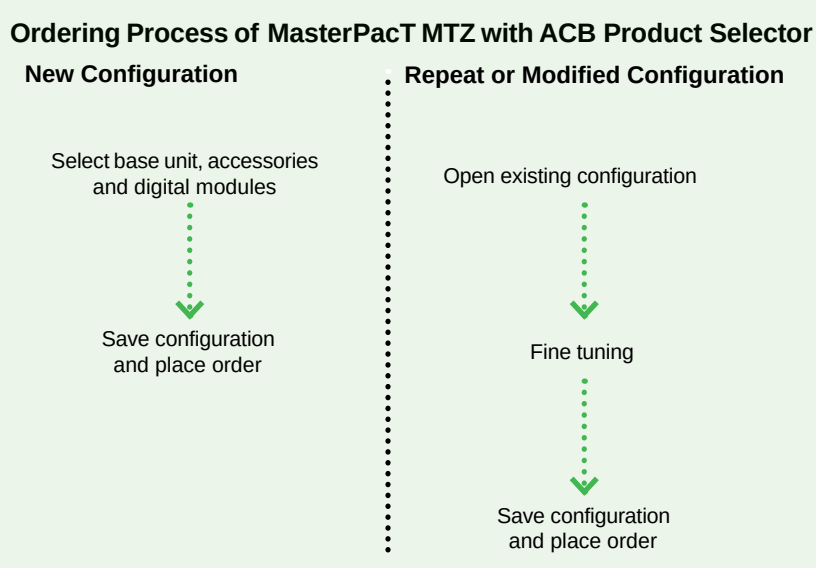
- ACB Product Selector: An online configuration tool for Schneider Electric low voltage product offer. It facilitates quick and accurate configuration and ordering of MasterPacT devices.
- MTZ QR Code: Innovative optical label placed on the faceplate that can be used to interact with MasterPacT MTZ devices, access important information to allow for different usage scenarios and customer habits.
- GoDigital: An online market place to purchase Digital Modules 24/7. It allows upgrading of MasterPacT MTZ circuit breakers at anytime, anywhere.

Product Selector

The ACB Product Selector provides a fast, secure and smart way of selecting and configuring LV circuit breaker ranges. It includes the selection of the basic frame, control unit, accessories and digital modules.

Compared to the traditional way for placing an order through Request for Quote (RFQ) forms, it brings the following benefits:

- Intuitive and interactive interface eases and speeds up the device configuration.
- Configuration rules are embedded, viable options are automatically filtered and completeness of the configuration is confirmed.
- The confirmed feature file can be saved either locally or through web services, allowing future repeated or modified configuration to be done in a fraction of the time.



NOTE: All configurations are normally done using the ACB Product Selector. If you have difficulties accessing or using the product selector, contact Schneider Electric Customer Care Center or your Schneider Electric sales representatives for more information about ordering MasterPacT MTZ devices.

MasterPacT MTZ QR Codes

MasterPacT MTZ circuit breakers have a QR code on the front cover of the circuit breaker control unit. Reading the QR code with a smartphone or tablet provides access to the device's characteristics, documents and downloads and the safe repository for authentication.

Safe Repository

The safe repository allows user access to circuit breaker configuration details such as the device's product code, serial number, and a high level Bill of Materials (BOM) format.

GoDigital with MasterPacT MTZ Devices

Go to GoDigital

To purchase Digital Modules for MasterPacT MTZ circuit breakers, link to GoDigital, the Schneider Electric digital marketplace. GoDigital stocks digital modules to customize a MicroLogic X control unit with advanced protection, metering, and diagnostic functions. It is open 24/7.

With GoDigital, customers can further customize the MicroLogic X control unit features at any time through the life of the control unit. Electrical contractors and facility managers can upgrade the installed base during the operational phase of the product life cycle, according to new requirements, anytime, without changing the hardware or disrupting operations.

> **NOTE:** Changing the protection functions among LI (MicroLogic 3.0 X), LSI (MicroLogic 5.0 X), and LISG (MicroLogic 6.0 X) requires changing out the MicroLogic X control unit.

Each Digital Module purchased is delivered with a software license for a unique MicroLogic X control unit and can only be installed on that particular MicroLogic X control unit.

Therefore, the MicroLogic X control unit serial number needs to be registered in the GoDigital platform for the first time purchase.

For the first purchase for a particular MicroLogic X control unit, three ways to register are available:

1) EcoStruxure Power Commission Software

When connected to MicroLogic X through either an USB or IFE/EIFE connection, EcoStruxure Power Commission Software can read the unique serial number and identify the MicroLogic X control unit. It will also show all the available Digital Modules which are compatible with that MicroLogic X firmware version. When clicking “Buy”, it will direct the user to the GoDigital marketplace with the MicroLogic X serial number automatically registered in it.

2) MasterPacT MTZ Mobile App

When connected to a MicroLogic X control unit through either a Bluetooth or NFC connection, MasterPacT MTZ mobile App will identify the MicroLogic X control unit and propose available Digital Modules. When clicking “Purchase”, it will direct the user to the GoDigital marketplace mobile version with the MicroLogic X serial number automatically registered in it.

3) GoDigital PC version

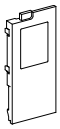
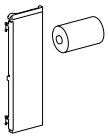
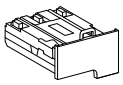
In the section”My assets”, choose the serial number of the MicroLogic X control unit to be upgraded and purchase the additional Digital Modules.

> **NOTE:** The GoDigital platform is only used to purchase Digital Modules for a MicroLogic X control unit which is already installed.
> When ordering a new circuit breaker, Digital Modules are selected using the ACB Product Selector and installed in the factory before delivery.
> The serial number is also printed on the faceplate of the MicroLogic X control unit.

MasterPacT MTZ Catalog Numbers

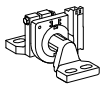
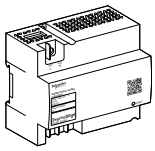
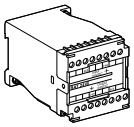
MasterPacT MTZ Catalog Numbers

MicroLogic X Control Unit Replacement Parts

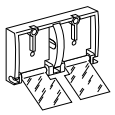
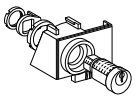
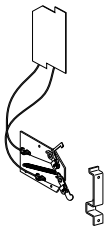
Replacement Parts for MicroLogic X Control Units			
			Catalog Number
MicroLogic X Embedded Display (EHMI)		MicroLogic X embedded display & wireless card	LV850054SP
MicroLogic X Battery + Transparent Cover		Battery (1 part)	LV833593SP
		Transparent Cover (1 part) For MicroLogic X	LV850053SP
Voltage Power Supply Module (VPS)		Voltage power supply module (VPS) for MicroLogic X	LV850060SP

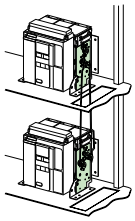
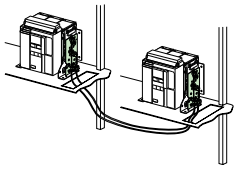
Replacement Parts for MicroLogic X Communication Option			
			Catalog Number
EIFE		Embedded Ethernet interface for LV circuit breaker	LV851100SP
IFE		Ethernet interface LV breaker	LV434010
		Ethernet interface for LV breakers and gateway	LV434011
IO Application Module		IO module for LV circuit breakers	LV434063
Microswitches for MTZ1		Microswitches for MTZ circuit breakers	LV847906SP

Accessories for MicroLogic X Control Units

Accessories for MicroLogic X Control Units				
				Catalog Number
External sensors		External sensor for ground-fault protection (TCE) / 1 part	Sensor rating 400/1600 A	LV833576SP
		Source ground return (SGR) ground-fault protection / 1 part	External sensor (SGR)	LV833579SP
			MDGF summing module	LV848891SP
External power supply module (AD) / 1 part		24–30 Vdc		54440
		48–60 Vdc		54441
		100–125 Vdc		54442
		110–130 Vdc		54443
		200–240 Vdc		54444
		380–415 Vdc		54445
Battery module (BAT) / 1 part		1 battery	24 Vdc	54446
USB Cable for MicroLogic X Control Unit		USB Cable (miniUSB/USB) for MicroLogic X control unit / 1 part		LV850067SP
Mobile Powerpack for MicroLogic X Control Unit		Mobile Powerpack for MicroLogic X control unit (by APC) / 1 part		LV850055SP

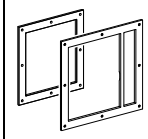
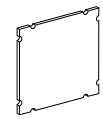
MasterPacT MTZ1 Accessory Catalog Numbers

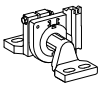
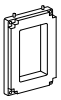
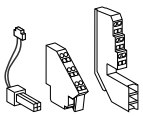
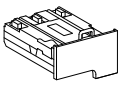
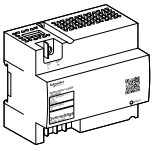
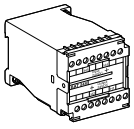
MasterPacT MTZ1 Circuit Breaker Locking				
				Catalog Number
Pushbutton Locking Device		By padlocks		LV833897
OFF Position Locking		Padlocks + BPFE support	VCPO	LV847514
		Profalux keylocks	1 lock with 1 key + adaptation kit	LV847519
			2 locks 1 key + adaptation kit	LV847520
		Ronis keylocks + BPFE support	1 lock with 1 key + adaptation kit	LV847521
			2 locks 1 key + adaptation kit	LV847522
		Ronis Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	LV847515SP
			adaptation kit Kirk	LV847517SP
			adaptation kit Castell	LV847518SP
Cable-Type Door Interlock		1 complete assembly for MasterPacT MTZ1 fixed devices		LV833920SP
		1 complete assembly for MasterPacT MTZ1 drawout devices		LV833921SP

MasterPacT MTZ1 Mechanical Interlocking for Source Changeover Catalog Numbers			
			Catalog Number
Interlocking Using Connecting Rods		Complete assembly with 2 adaptation fixtures + rods	
		2 MasterPacT MTZ1 fixed devices	LV833203SP
		2 MasterPacT MTZ1 drawout devices	LV833204SP
		1 set of 2 interlocking rods	LV833210SP
Interlocking Using Cables [60]		Choose 2 adaptation fixtures (1 for each breaker) + 1 set of cables	
		1 adaptation fixture for MasterPacT MTZ1 fixed devices	LV833200SP
		1 adaptation fixture for MasterPacT MTZ1 drawout devices	LV833201SP
		1 set of 2 cables	LV833209SP

MasterPacT MTZ1 Mechanical Operation Accessories			
			Catalog Number
Mechanical Operation Counter		Operation counter CDM	LV833895

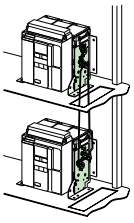
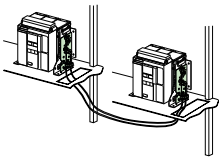
60. Can be used with any combination of MTZ, fixed or drawout devices.

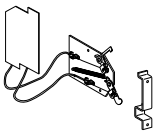
MasterPacT MTZ1 Escutcheon Accessories				
			Catalog Number	
			Fixed	Drawout
Escutcheon and Accessories		Escutcheon	LV833718SP	LV833857SP
		Transparent cover (IP54)	—	LV833859SP
		Escutcheon blanking plate	—	LV833858SP

MasterPacT MTZ1 Accessories for MicroLogic X Control Units				
				Catalog Number
External Sensors		External Sensor for Ground-Fault Protection (TCE)	Sensor Rating 400/1600 A	LV833576SP
		Source Ground Return (SGR) Ground-Fault Protection	External Sensor (SGR)	LV833579SP
			MDGF Summing Module	LV848891SP
		Voltage Measurement Input (for Circuit Breakers Supplied via Bottom Terminals)	Voltage Measurement Input Fixed	LV847506
			Drawout	LV847507
Voltage Power Supply Module (VPS) for MicroLogic X				LV850060
Zone Selective Interlocking Option for MicroLogic X (ZSI)				Standard
External Power Supply Module (AD)		24/30 Vdc		54440
		48/60 Vdc		54441
		100/125 Vdc		54442
		110/130 Vac		54443
		200/240 Vac		54444
		380/415 Vac		54445
Battery Module (BAT)		1 battery 24 V		54446

MasterPacT MTZ1 Test and Commissioning Equipment Catalog Numbers			
			Catalog Number
USB Cable (miniUSB/USB) for MicroLogic X Control Unit		Hand held test kit (HHTK)	LV850067SP
Mobile Power Pack for MicroLogic X Control Unt (by APC)		Full function test kit (FFTK)	LV850055SP

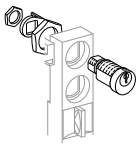
MTZ1 Mechanical Interlocking for Source Changeover Spare Parts

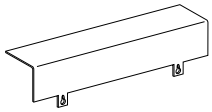
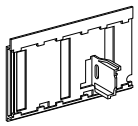
Spare Parts for Source Changeover Mechanical Interlocking			
			Catalog Number
Interlocking Using Connecting Rods		Complete assembly with 2 adaptation fixtures + rods	
		2 MasterPacT MTZ1 fixed devices **NOTE:** The installation manual is enclosed.	LV833912SP
		2 MasterPacT MTZ1 drawout devices **NOTE:** The installation manual is enclosed.	LV833913SP
Interlocking Using Cables [61]		Choose 2 adaptation fixtures (1 for each device) + 1 set of cables	
		1 adaptation fixture for MasterPacT MTZ1 fixed devices	LV833200SP
		1 adaptation fixture for MasterPacT MTZ1 drawout devices	LV833201SP
		1 set of 2 cables	PGL36060

Cable-Type Door Interlock		
		Catalog Number
	1 complete assembly for MasterPacT MTZ1 fixed devices **NOTE:** The installation manual is enclosed.	LV833920SP
	1 complete assembly for MasterPacT MTZ1 drawout devices **NOTE:** The installation manual is enclosed.	LV833921SP

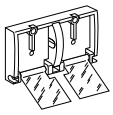
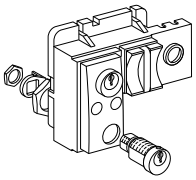
61. Can be used with any combination of MTZ1 or MTZ2/3, fixed or drawout devices.

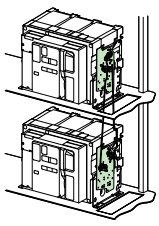
MasterPacT MTZ1 Cradle Locking and Accessories Spare Parts

Cradle Locking Spare Parts				
				Catalog Number
“Disconnected” Position Locking / 1 Part		By padlocks	VCPO	Standard
		By Profalux keylocks		
		Profalux	1 lock with 1 key + adaptation kit	LV864909SP
			2 locks 1 key + adaptation kit	LV864910SP
			2 locks 2 different keys + adaptation kit	LV864911SP
		1 keylock Profalux (without adaptation kit):	Identical key not identified combination	LV833173SP
			Identical key identified 215470 combination	LV833174SP
			Identical key identified 215471 combination	LV833175SP
		By Ronis keylocks		
		Ronis	1 lock with 1 key + adaptation kit	LV864912SP
			2 locks 1 key + adaptation kit	LV864913SP
			2 locks 2 different keys + adaptation kit	LV864914SP
		1 keylock Ronis (without adaptation kit):	Identical key not identified combination	LV833189SP
			Identical key identified EL24135 combination	LV833190SP
			Identical key identified EL24153 combination	LV833191SP
			Identical key identified EL24315 combination	LV833192SP
		Adaptation kit (without keylock):	Adaptation kit Profalux / Ronis	LV833769SP
			Adaptation kit Kirk	LV833770SP
			Adaptation kit Castell	LV833771SP
Door Interlock / 1 Part		Right and left-hand side of cradle (VPECD or VPECG)		LV833772SP
Racking Interlock		Racking interlock (VPOC)		LV833788SP
Cradle Rejection Kit		Cradle Rejection Kit (VDC)		LV833767SP

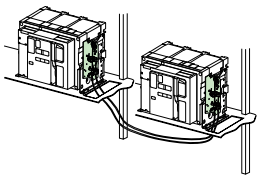
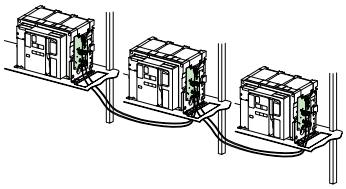
Cradle Accessories				
			3P	4P
Auxiliary Terminal Shield (CB) / 1 part		Terminal Shield	LV833763SP	LV833764SP
Safety Shutters		Safety Shutters (VO)	S48933	S48934

MasterPacT MTZ2 and MTZ3 Accessory Catalog Numbers

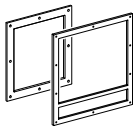
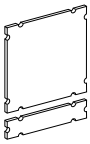
MasterPacT MTZ2/MTZ3 Circuit Breaker Locking Catalog Numbers				
				Catalog Number
Pushbutton Locking Device		By padlocks		LV848536
OFF Position Locking		Padlocks + BPFE support	VCPO	LV848539
		Profalux keylocks	1 lock with 1 key + adaptation kit	LV848545
			2 locks 1 key + adaptation kit	LV848546
			2 locks 2 different keys + adaptation kit	LV848547
		Ronis keylocks + BPFE support	1 lock with 1 key + adaptation kit	LV848549
			2 locks 1 key + adaptation kit	LV848550
			2 locks 2 different keys + adaptation kit	LV848551
		Ronis Adaptation kit (without keylock):	Adaptation kit Profalux / Ronis	LV848541SP
			Adaptation kit Kirk	LV848542SP
			Adaptation kit Castell	LV848543SP
Cable-Type Door Interlock		1 complete assembly for MasterPacT MTZ2/MTZ3 fixed or drawout device		LV848614SP

MasterPacT MTZ2/MTZ3 Mechanical Interlocking for Source Changeover Catalog Numbers			
			Catalog Number
Interlocking of 2 devices using connecting rods		Complete assembly with 2 adaptation fixtures + rods	
		1 set of 2 adaptation fixtures for MasterPacT MTZ2 or MTZ3 fixed or drawout device	LV847930SP
		1 set of 2 interlocking rods	LV833210SP
		NOTE: Can be used with 1 MTZ2/3 fixed + 1 MTZ2/3 drawout.	

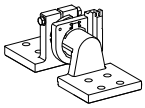
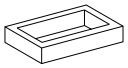
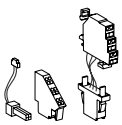
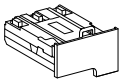
MasterPacT MTZ2/MTZ3 Mechanical Interlocking for Source Changeover Catalog Numbers

			Catalog Number
Interlocking of 2 Devices Using Cables[62]		Choose 2 adaptation fixtures (1 for each device) + 1 set of cables	
		1 adaptation fixture for MasterPacT MTZ2/3 fixed devices	LV847926SP
		1 adaptation fixture for MasterPacT MTZ2/3 drawout devices	LV847926SP
		1 set of 2 cables of 2.5 m	LV833209SP
Interlocking of 3 Devices Using Cables		Choose 1 interlocking kit (including 3 adaptation fixtures + cables)	
		3 sources, only 1 device closed, fixed or drawout devices	LV848610SP
		2 sources + 1 coupling, fixed or drawout devices	LV848609SP
		2 normal + 1 replacement source, fixed or drawout devices	LV848608SP

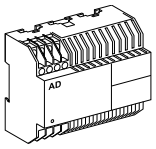
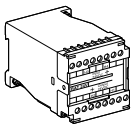
Other MasterPacT MTZ2/MTZ3 Circuit Breaker Accessories Catalog Numbers

					Catalog Numbers	
Mechanical Operation Counter				Operation counter CDM	LV848535	
Escutcheon and Accessories	 Escutcheon Cover Blanking Plate	 Escutcheon Cover Blanking Plate	 Escutcheon Cover Blanking Plate		Fixed	Drawout
				Escutcheon	LV848601SP	LV848603SP
				Transparent cover (IP54)	—	LV848604SP
				Escutcheon blanking plate	LV848605SP	LV848605SP

MasterPacT MTZ2/MTZ3 Accessories for MicroLogic X Control Units

					Catalog Number
External Sensors		External Sensor for Ground-Fault Protection (TCE)	Sensor rating	400/2000 A	LV834035SP
				1000/4000 A	LV834036SP
				4000/6300 A (MTZ3)	LV848182SP
			Single sensor kit	2000/6300 A	LV848904SP
			3 layer bus	2000 A	LV848905SP
		Source Ground Return (SGR) Ground-fault protection	External sensor (SGR)		LV833579SP
			MDGF summing module		LV848891SP
		Voltage Measurement Input (for breakers supplied via bottom terminals)	Voltage measurement input fixed		LV847506
			Drawout		LV848533
Voltage Power Supply Module (VPS) for MicroLogic X					LV850060

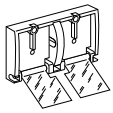
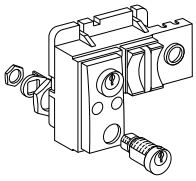
62. Can be used with any combination of MTZ, fixed or drawout devices.

MasterPacT MTZ2/MTZ3 Accessories for MicroLogic X Control Units			
			Catalog Number
Zone Selective Interlocking option for MicroLogic X Control Unit		ZSI	Standard
External Power Supply Module (AD)		24/30 Vdc	54440
		48/60 Vdc	54441
		100/125 Vdc	54442
		110/130 Vac	54443
		200/240 Vac	54444
		380/415 Vac	54445
Battery Module (BAT)		1 battery 24 V	54446

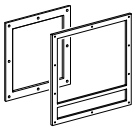
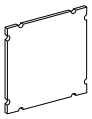
MasterPacT MTZ2/MTZ3 Test and Commissioning Equipment Catalog Numbers			
			Catalog Number
USB Cable (miniUSB/USB) for MicroLogic X Control Unit		Hand Held Test kit (HHTK)	LV850067SP
Mobile Power Pack for MicroLogic X Control Unt (by APC)		Full Function Test kit (FFTK)	LV850055SP

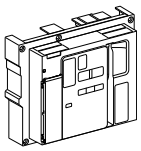
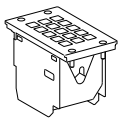
MasterPacT MTZ2/MTZ3 Special Settings To be Specified When Ordering											
Sensors Rating	**MTZ2 08**	**MTZ2 10**	**MTZ2 12**	**MTZ2 16**	**MTZ2 20**	**MTZ2 25**	**MTZ2 32**	**MTZ2 40**	**MTZ3 40**	**MTZ3 50**	**MTZ3 63**
400	X	X									
630	X	X	X								
800		X	X	X							
1000			X	X	X						
1250				X	X	X					
1600					X	X	X				
2000						X	X	X	X		
2500							X	X	X	X	
3200								X	X	X	X
4000										X	X
5000										X	X
6000											

MTZ2/MTZ3 Circuit Breaker Locking and Accessories Spare Parts

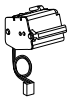
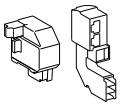
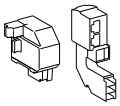
Circuit Breaker Locking Spare Parts				
				Catalog Number
Pushbutton Locking Device / 1 part		By padlocks		LV848536SP
OFF Position Locking / 1 part		Padlocks		LV848539SP
		By Profalux keylocks		
		Profalux	1 lock with 1 key + adaptation kit	LV864928SP
			2 locks 1 key + adaptation kit	LV864929SP
			2 locks 2 different keys + adaptation kit	LV864930SP
		1 keylock Profalux (without adaptation kit):	Identical key not identified combination	LV833173SP
			Identical key identified 215470 combination	LV833174SP
			Identical key identified 215471 combination	LV833175SP
		By Ronis keylocks		
		Ronis	1 lock with 1 key + adaptation kit	LV864931SP
			2 locks 1 key + adaptation kit	LV864932SP
			2 locks 2 different keys + adaptation kit	LV864933SP
		1 keylock Ronis (without adaptation kit):	Identical key not identified combination	LV833189SP
			Identical key identified EL24135 combination	LV833190SP
			Identical key identified EL24153 combination	LV833191SP
			Identical key identified EL24315 combination	LV833192SP
		Adaptation kit (without keylock):	Adaptation kit Profalux / Ronis	LV864925SP
			Adaptation kit Kirk	LV864926SP
			Adaptation kit Castell	PGL36060

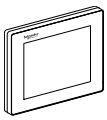
Circuit Breaker Mechanical Counter			
			Catalog Number
Mechanical Operation Counter		Operation counter CDM	LV848535SP

Escutcheon Accessories				
			Catalog Number	
			Fixed	Drawout
Escutcheon and Accessories / 1 part		Escutcheon	LV848601SP	LV848603SP
		Transparent cover (IP 54)	LV848604SP	LV848604SP
		Escutcheon blanking plate	LV848605SP	

Other Circuit Breaker Accessories				
			Catalog Number	
			Fixed	Drawout
Front Cover (3P / 4P) / 1 part		Front cover	LV847939SP	
Spring Charging Handle / 1 part		Spring charging handle	LV847940SP	
Arc Chute for MasterPacT MTZ2/3 / 1 part			3P	4P
		Type N1/NA/HF	3 x LV847935SP	4 x LV847935SP
		Type H1/H2/HA (MTZ2 08 to MTZ2 40)	3 x LV847935SP	4 x LV847935SP
		Type H1/H2/HA (MTZ3 40 to MTZ3 63)	6 x LV847936SP	8 x LV847936SP
		Type H3	3 x LV847936SP	4 x LV847936SP
		Type H10/HA10	3 x LV847869SP	4 x LV847869SP
		Type L1	3 x LV847937SP	4 x LV847937SP

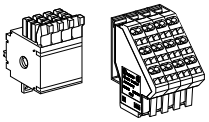
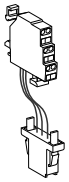
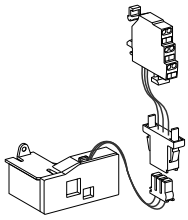
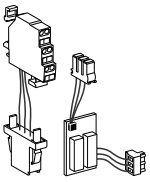
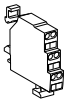
MTZ2/MTZ3 Communication, Monitoring, and Control Spare Parts

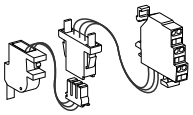
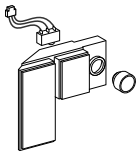
Communication Option Spare Parts					
					Catalog Number
Communication Options			EIFE	Embedded Ethernet module full spare part kit for MTZ2/3 drawout	LV851200SP
				Embedded Ethernet spare part module MTZ1/2/3 drawout	LV851001SP
			IFE	Ethernet interface LV breaker	LV434010
				Ethernet interface for LV breakers and gateway	LV434011
			Microswitches for MTZ2/3		LV847905SP
			EIFE Accessories spare part kit for MTZ2/3		LV851220SP
			I/O application module		LV434063
ULP port modules			ULP port - for MasterPacT MTZ2/3 - fixed		LV850061SP
			ULP port - for MasterPacT MTZ2/3 - drawout		LV850056SP
Accessories for Diagnostics & Communicating Coils			Isolation module - for MX1/XF communicating coils		LV850056SP

Monitoring and Control Spare Parts		
		Catalog Number
Ethernet display module		
	Electrical Equipment front display module FDM128 LV434128	LV434128
ULP wiring accessories [63]		
	Breaker ULP cord L = 0.35 m	LV434195
	Breaker ULP cord L = 1.3 m	LV434196
	Breaker ULP cord L = 3 m	LV434197
	10 Modbus line terminators	VW3A8306DRC[64]
	5 RJ45 connectors female/female	TRV00870
	10 ULP line terminators	TRV00880
	10 RJ45/RJ45 male cord L = 0.3 m	TRV00803
	10 RJ45/RJ45 male cord L = 0.6 m	TRV00806
	5 RJ45/RJ45 male cord L = 1 m	TRV00810
	5 RJ45/RJ45 male cord L = 2 m	TRV00820
	5 RJ45/RJ45 male cord L = 3 m	TRV00830
	1 RJ45/RJ45 male cord L = 5 m	TRV00850

63. For measurement display with MicroLogic X control unit.
64. See TeSys catalog.

MTZ2/MTZ3 Drawout Circuit Breaker Indication Contacts Catalog Numbers

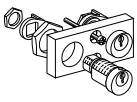
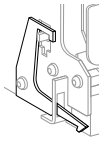
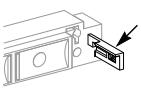
MasterPacT MTZ2/MTZ3 Drawout Circuit Breaker Indication Contact Catalog Numbers				
				Catalog Number
ON/OFF Indication Contacts (OF)		Block of 4 changeover contacts (6 A - 240 V)		1 block (standard)
		1 additional block of 4 contacts (2 max.)		LV848468
Combined Closed / Connected Contacts for Use with 1 Auxiliary Contact		1 contact (5 A - 240 V) (8 max.)		LV848477
		or 1 low-level contact (8 max.)		LV848478
"Fault Trip" Indication Contacts (SDE)		Changeover contact (6 A - 240 V)		1 (standard)
		1 additional SDE (6 A - 240 V)		LV848475
		1 additional low-level SDE		LV848476
Programmable Contacts (Programmed via MicroLogic X Control Unit)		2 contacts (M2C) (5 A - 240 V)		LV848382
Cradle Switches (Connected / Disconnected / Test position)		Changeover contacts (6 A - 240 V)	1 connected position contact (3 max.)	LV833751
			1 test position contact (1 max.)	LV833752
			1 disconnected position contact (2 max.)	LV833753
		And/or low-level changeover contacts	1 connected position contact (3 max.)	LV833754
			1 test position contact (1 max.)	LV833755
			1 disconnected position contact (2 max.)	LV833756
			Actuator for additional cradle switches	LV848560SP
Auxiliary Terminals for Cradle Alone		3 wire terminal (30 parts)		LV847900SP
		6 wire terminal (10 parts)		LV847898SP
		Jumpers (10 parts)		LV847900SP

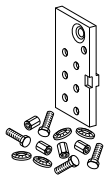
MasterPacT MTZ2/MTZ3 Drawout Circuit Breaker Indication Contact Catalog Numbers			
			Catalog Number
"Ready to Close" Contact (1 max.) (PF)		1 changeover contact (5 A - 240 V)	LV848469
		1 low-level changeover contact	LV848470
Electrical Closing Pushbutton (BPFE)		1 pushbutton	LV848537

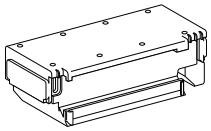
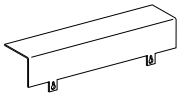
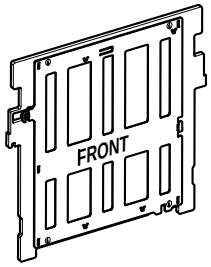
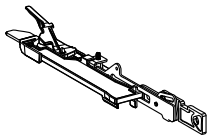
MTZ2/MTZ3 Remote Operation Catalog Numbers

MasterPacT MTZ2/MTZ3 Drawout Circuit Breaker Remote Operation Catalog Numbers				
				Catalog Number
Remote Reset After Fault Trip		Electrical reset RES	110/130 Vac	LV848472
			220/240 Vac	LV848473
		Automatic reset RAR	Adaptation	LV847346

MTZ2/MTZ3 Drawout Cradle Locking and Accessories Catalog Numbers

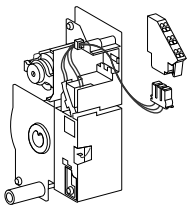
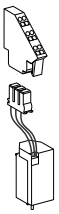
MasterPacT MTZ2/MTZ3 Drawout Circuit Breaker Cradle Locking Catalog Numbers				
				Catalog Number
"Disconnected" Position Locking		By padlocks	VCPO	Standard
		By Profalux keylocks	1 lock with 1 key + adaptation kit	LV848568
			2 locks 1 key + adaptation kit	LV848569
			2 locks 2 different keys + adaptation kit	LV848570
		By Ronis keylocks	1 lock with 1 key + adaptation kit	LV848572
			2 locks 1 key + adaptation kit	LV848573
			2 locks 2 different keys + adaptation kit	LV848574
		Optional disconnected/test/connected position locking		LV833779
		Adaptation kit (without keylock):	Adaptation kit Profalux / Ronis	LV848564SP
			Adaptation kit Castell	—
			Adaptation kit Kirk	LV848566SP
Door Interlock (1 part)		Right-hand side of cradle		LV848579
		Left-hand side of cradle		LV848580
Racking Interlock		Racking interlock (VPOC)		LV833788

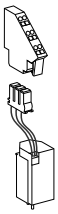
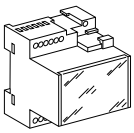
MasterPacT MTZ2/MTZ3 Drawout Circuit Breaker Cradle Locking Catalog Numbers			
			Catalog Number
Racking Interlock Between Crank and OFF Pushbutton	1 part		LV848585
Automatic Spring Discharge Before Circuit Breaker Removal		1 part	LV848554
Cradle Rejection Kit		Cradle Rejection Kit (VDC)	LV833767SP

MasterPacT MTZ1 Drawout Circuit Breaker Cradle Accessories Catalog Numbers					
				Catalog Number	
				3P	4P
Arc Chute Cover		3P/4P		Standard	Standard
Auxiliary Terminal Shield (CB)		Terminal shield	MasterPacT MTZ2	LV833763	LV833764
			MasterPacT MTZ3		
Safety Shutters		Safety shutters (VO)	MasterPacT MTZ2	65346	65347
			MasterPacT MTZ3	65348	65349
Shutter Padlock Provision		Shutter padlock provision	MasterPacT MTZ2	65350	65350
			MasterPacT MTZ3	65350	65350

MTZ2/MTZ3 Fixed Circuit Breaker Remote Operation Catalog Numbers

MasterPacT MTZ2/MTZ3 Fixed Circuit Breaker Remote ON/OFF Catalog Numbers

MasterPacT MTZ2/MTZ3 Fixed Circuit Breaker Remote ON/OFF Catalog Numbers					
				Catalog Number	
Gear Motor (MCH)	DB404316.eps 	AC 50/60 Hz	48 V	LV848207	
			100/130 V	LV848211	
			200/240 V	LV848212	
			250/277 V	V848213	
			277/415 V	LV848214	
			440/480 V	LV848215	
		DC	24/30 V	LV848206	
			48/60 V	LV848207	
			100/130 V	LV848208	
			200/250 V	LV848209	
Instantaneous Voltage Releases		Standard		Shunt Close (XF)	Shunt Trip (MX)
		AC 50/60 Hz DC	24/30 Vdc, 24 Vac	LV847350	LV847360
			48/60 Vdc, 48 Vac	LV847351	LV847361
			100/130 Vac/dc	LV847352	LV847362
			200/250 Vac/dc	LV847353	LV847363
			277 Vac	LV847354	LV847364
			380/480 Vac	LV847355	LV847365
		Diagnostics & Communicating		XF diag & com	MX diag & com
		AC 50/60 Hz DC	24/30 Vdc, 24 Vac	LV847311	LV847321
			48/60 Vdc, 48 Vac	LV847312	LV847322
			100/130 Vac/dc	LV847313	LV847323
			200/250 Vac/dc	LV847314	LV847324
			277 Vac	LV847315	LV847325
			380/480 Vac	LV847316	LV847326
		Standard		Undervoltage Release (MN)	
		AC 50/60 Hz DC	24/30 Vdc, 24 Vac	LV847380	
			48/60 Vdc, 48 Vac	LV847381	
			100/130 Vac/dc	LV847382	
			200/250 Vac/dc	LV847383	
			380/480 Vac	LV847385	
		Diagnostics			
		AC 50/60 Hz DC	24/30 Vdc, 24 Vac	LV836700	
			48/60 Vdc, 48 Vac	LV836701	
			100/130 Vac/dc	LV836702	
			200/250 Vac/dc	LV836703	
			380/480 Vac	LV836704	

MasterPacT MTZ2/MTZ3 Fixed Circuit Breaker Remote Tripping Catalog Numbers					
				Catalog Number	
Instantaneous Voltage Release				2nd MX	
		AC 50/60 Hz DC	24/30 Vdc, 24 Vac	LV847370	
			48/60 Vdc, 48 Vac	LV847371	
			100/130 Vac/dc	LV847372	
			200/250 Vac/dc	LV847373	
			277 Vac	LV847374	
			380/480 Vac	LV847375	
MN Delay Unit				R (non-adjustable)	Rr (adjustable)
		AC 50/60 Hz DC	48/60 Vac/dc	—	LV833680SP
			100/130 Vac/dc	LV833684SP	LV833681SP
			200/250 Vac/dc	LV833685SP	LV833682SP
			380/480 Vac/dc	—	LV833683SP

Ordering MasterPacT MTZ Devices

We are expanding our digital tools to simplify and expedite the ordering of MasterPacT MTZ devices:

- ACB Product Selector: An online configuration tool for Schneider Electric low voltage product offer. It facilitates quick and accurate configuration and ordering of MasterPacT devices.
- MTZ QR Code: Innovative optical label placed on the faceplate that can be used to interact with MasterPacT MTZ devices, access important information to allow for different usage scenarios and customer habits.
- GoDigital: An online market place to purchase Digital Modules 24/7. It allows upgrading of MasterPacT MTZ circuit breakers at anytime, anywhere.

MyPacT Online Software Tool

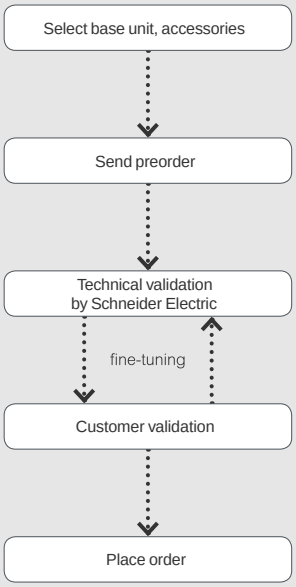
Go to MyPacT

MyPacT online software tool provides a fast, secure, and smart way of selecting and configuring LV circuit breakers. It includes the selection of the basic frame, control unit, accessories and digital modules. Compared with the traditional way of filling up order forms or specifying customer functions, it brings the following benefits:

- state-of-the-art ergonomic, intuitive and interactive interface eases and speeds up the configuration
- configuration rules are embedded, compatible options are automatically filtered and completeness of the configuration is checked. This results in compatible configurations and saves time fixing configuration errors.
- configurations can be saved either locally or through cloud service. Repeated or modified configurations can be done in a fraction of the time.

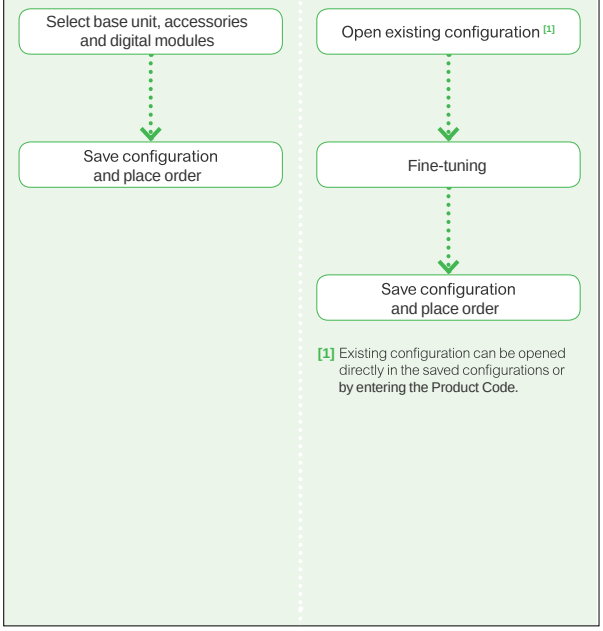
Yesterday,

Ordering process of MasterPacT NT/NW, new or repeat or modified configuration

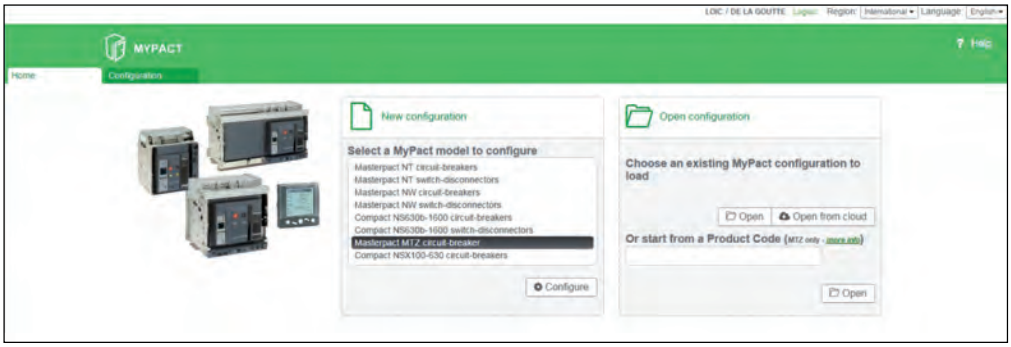


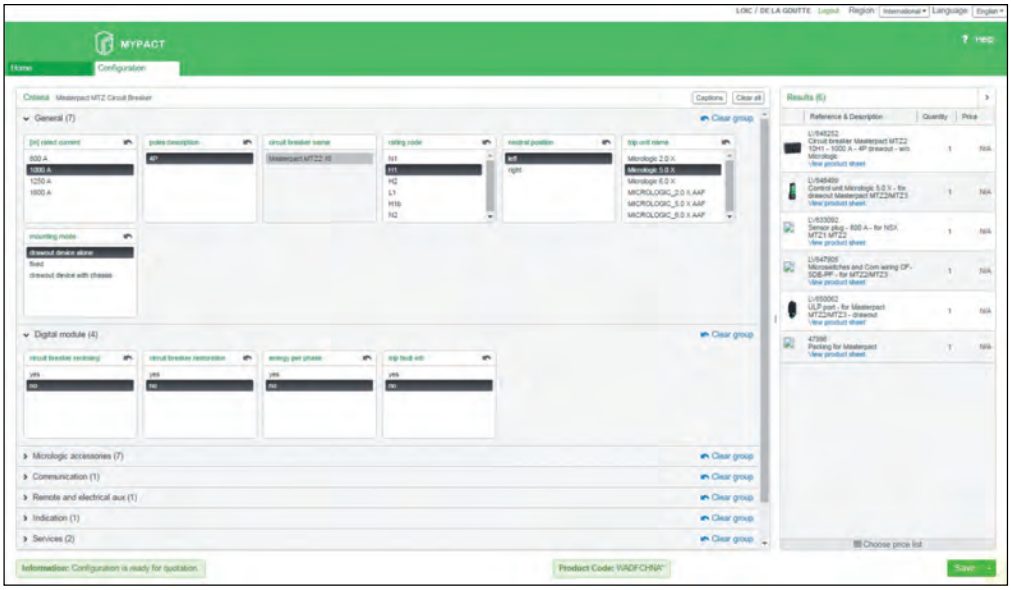
Today,

Ordering process of MasterPacT MTZ with MyPacT



[1] Existing configuration can be opened directly in the saved configurations or by entering the Product Code.





MasterPacT MTZ Product Code

MasterPacT MTZ Product Code is an alphanumeric code representing the complete configuration of a MasterPacT MTZ circuit breaker. It is automatically generated for each MasterPacT MTZ circuit breaker after completing the configuration through MyPact. It will appear in the invoice and delivery documents as well as the labelling on the MasterPacT MTZ circuit breaker and the packaging.

MasterPacT MTZ Product Code brings the following benefits:

- Quick and unique identification of the initial configuration of a circuit breaker by reading the code on the physical products or other recordings
- Reordering the same MasterPacT MTZ circuit breaker is simplified by communicating configuration through the product code
- Recording or sharing information about the initial configuration of a circuit breaker is simplified

Details of the coding rules can be accessed through the MyPact portal:

- All options of accessories are coded.
- The minimum length of the code is 9 characters and the maximum length of the code is 33 characters[65] depending on the choice of the accessories.
- Capital letters, numbers and start sign are used.

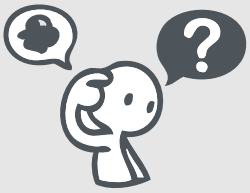
Example MasterPacT MTZ Product Code

> Product Code: WADFEEADNA**

- MasterPacT type: MTZ2
- Rating: 1000A
- Sensor rating: 800A
- Performance Level: H1
- MicroLogic: 5.0 X
- VPS module: Yes
- Number of poles: 4P
- Type of installation: Drawout with cradle
- Connection: Top Horizontal Bottom Horizontal
- Type of communication: ULP + EIFE without I/O module
- Accessories for Design & Installation simplification and operation efficiency: No
- Accessories for additional People and Property Protection: No
- Digital Modules: Energy per phase

65. The maximum length of the code may change due to future enrichment of the offer.

Before Product Code

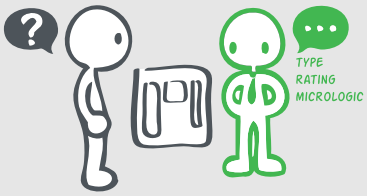


Calling CCC and try to explain
all the customer functions

To share information with colleagues or Schneider Electric CCC

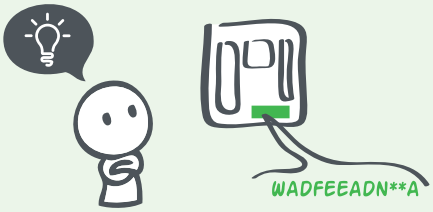
With Product Code

Sending a text message
through CCC app with the product code



Engaging Schneider Electric
Field Service to conduct an analysis

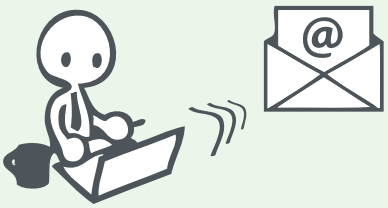
To know the configuration of a circuit breaker



Checking the product code
on the physical products

Fill up order form or calling
Schneider Electric CCC

To reorder a circuit breaker



Share the product code
with your representative

MasterPacT MTZ Spare Parts Catalog Numbers

MasterPacT MTZ ANSI C37/UL 1066 Catalog Numbers

MasterPacT MTZ1 ANSI C37/UL 1066 Catalog Numbers

			Catalog Number	
			3P	4P
MasterPacT MTZ1 ANSI Fixed Circuit Breakers				
Type N1	MTZ1 08	800 A	LV839102	—
MasterPacT MTZ1 ANSI Drawout Circuit Breakers				
Type H1	MTZ1 08	800 A	LV839103	—
MasterPacT MTZ1 ANSI Fixed Non-Automatic Switches				
Type NA	MTZ1 08	800 A	LV839104	—
MasterPacT MTZ1 ANSI Drawout Non-Automatic Switches				
Type NA	MTZ1 08	800 A	LV839105	—

MasterPacT MTZ2 ANSI C37/UL 1066 Circuit Breakers

			Catalog Number	
			3P	4P
MasterPacT MTZ2 ANSI Fixed Circuit Breakers				
Type N1	MTZ2 08	800	LV838924	LV838926
	MTZ2 16	1600	LV838928	—
Type H1	MTZ2 08	800	LV838932	LV838934
	MTZ2 16	1600	LV838936	LV838938
	MTZ2 20	2000	LV838940	LV838942
	MTZ2 32	3200	LV838944	LV838944
	MTZ2 40	4000	LV838948	—
Type H2	MTZ2 08	800	LV838967	LV838969
	MTZ2 16	1600	LV838971	LV838973
	MTZ2 20	2000	LV838975	LV838977
	MTZ2 32	3200	LV838979	LV838981
	MTZ2 40	4000	LV838983	—
MasterPacT MTZ2 ANSI Drawout Circuit Breakers				
Type H3	MTZ2 08	800	LV839009	LV839011
	MTZ2 16	1600	LV839013	LV839015
	MTZ2 20	2000	LV839017	LV839019
	MTZ2 32	3200	LV839021	LV839023
	MTZ2 40	4000	LV839025	—
Type N1	MTZ2 08	800	LV838925	LV838927
	MTZ2 16	1600	LV838929	LV838931
Type H1	MTZ2 08	800	LV838933	LV838935
	MTZ2 16	1600	LV838937	LV838939
	MTZ2 20	2000	LV838941	LV838943
	MTZ2 32	3200	LV838945	LV838947
Type H2	MTZ2 08	800	LV838968	LV838970
	MTZ2 16	1600	LV838972	LV838974
	MTZ2 20	2000	LV838976	LV838978
	MTZ2 32	3200	LV838980	LV838982
Type H3	MTZ2 08	800	LV839010	LV839012
	MTZ2 16	1600	LV839014	LV839016
	MTZ2 20	2000	LV839018	LV839020
	MTZ2 32	3200	LV839022	LV839024
Type L1	MTZ2 08	800	LV839069	—
	MTZ2 16	1600	LV839071	—
	MTZ2 20	2000	LV839073	—
Type L1F	MTZ2 08	800	LV839097	—
	MTZ2 16	1600	LV839099	—
	MTZ2 20	2000	LV839101	—

MasterPacT MTZ2 ANSI C37/UL 1066 Switches

			Catalog Number	
			3P	4P
MasterPacT MTZ2 ANSI Fixed Non-Automatic Switches				
Type HA	MTZ2 08	800	LV838950	LV838952
	MTZ2 16	1600	LV838954	LV838956
	MTZ2 20	2000	LV838958	LV838960
	MTZ2 32	3200	LV838962	LV838964
	MTZ2 40	4000	LV838966	—
MasterPacT MTZ2 ANSI Fixed Automatic Switches				
Type HF	MTZ2 08	800	LV839038	LV839040
	MTZ2 16	1600	LV839042	LV839044
	MTZ2 20	2000	LV839046	LV839048
	MTZ2 32	3200	LV839050	LV839052
	MTZ2 40	4000	LV839054	—
MasterPacT MTZ2 ANSI Drawout Non-Automatic Switches				
Type HA	MTZ2 08	800	LV838951	LV838953
	MTZ2 16	1600	LV838955	LV838957
	MTZ2 20	2000	LV838959	LV838961
	MTZ2 32	3200	LV838963	LV838965
MasterPacT MTZ2 ANSI Drawout Automatic Switches				
Type HF	MTZ2 08	800	LV839039	LV839041
	MTZ2 16	1600	LV839043	LV839045
	MTZ2 20	2000	LV839047	LV839049
	MTZ2 32	3200	LV839051	LV839053
Type HC	MTZ2 08	800	LV839083	—
	MTZ2 16	1600	LV839085	—
	MTZ2 20	2000	LV839087	—

MasterPacT MTZ3 ANSI C37/UL 1066 Circuit Breakers

			Catalog Number	
			3P	4P
MasterPacT MTZ3 ANSI Fixed Circuit Breakers				
Type H2	MTZ3 40	4000	LV838985	LV838987
	MTZ3 50	5000	LV838989	LV838991
	MTZ3 60	6000	LV838993	LV838995
Type H3	MTZ3 40	4000	LV839026	LV839028
	MTZ3 50	5000	LV839030	LV839032
	MTZ3 60	6000	LV839034	LV839036
MasterPacT MTZ3 ANSI Drawout Circuit Breakers				
Type H2	MTZ3 40	4000	LV838986	LV838988
	MTZ3 50	5000	LV838990	LV838992
	MTZ3 60	6000	LV838994	LV838996
Type H3	MTZ3 40	4000	LV839027	LV839029
	MTZ3 50	5000	LV839031	LV839033
	MTZ3 60	6000	LV839035	LV839037
Type L1	MTZ3 32	3200	LV839075	—
	MTZ3 40	4000	LV839077	—
	MTZ3 50	5000	LV839079	—
	MTZ3 60	6000	LV839081	—

MasterPacT MTZ3 ANSI C37/UL 1066 Switches

			Catalog Number	
			3P	4P
MasterPacT MTZ3 ANSI Fixed Non-Automatic Switches				
Type HA	MTZ3 40	4000	LV838997	LV838999
	MTZ3 50	5000	LV839001	LV839003
	MTZ3 60	6000	LV839005	LV839007
MasterPacT MTZ3 ANSI Fixed Automatic Switches				
Type HF	MTZ3 40	4000	LV839056	LV839058
	MTZ3 50	5000	LV839060	LV839060
	MTZ3 60	6000	LV839064	LV839066
MasterPacT MTZ3 ANSI Non-Automatic Switches Drawout				
Type HA	MTZ3 40	4000	LV838998	LV839000
	MTZ3 50	5000	LV839002	LV839004
	MTZ3 60	6000	LV839006	LV839008
MasterPacT MTZ3 ANSI Drawout Automatic Switches				
Type HF	MTZ3 40	4000	LV839057	LV839059
	MTZ3 50	5000	LV839061	LV839063
	MTZ3 60	6000	LV839065	LV839067
Type HC	MTZ3 32	3200	LV839089	—
	MTZ3 40	4000	LV839091	—
	MTZ3 50	5000	LV839093	—
	MTZ3 60	6000	LV839095	—

MasterPacT MTZ UL489 Catalog Numbers

MasterPacT MTZ1 UL489 Catalog Numbers

			Catalog Number		
			3P	4P	4P RHN
MasterPacT MTZ1 UL Fixed Circuit Breakers					
Type N	MTZ1 08	800	LV833631	LV833632	—
	MTZ1 12	1200	LV833633	LV833634	—
	MTZ1 16	1600	LV839106	LV839107	—
Type H	MTZ1 08	800	LV839108	—	
	MTZ1 12	1200	LV839110	—	
	MTZ1 16	1600	LV839112	—	
Type L	MTZ1 08	800	LV839125	—	
	MTZ1 12	1200	LV839127	—	
	MTZ1 16	1600	LV839129	—	
Type L1	MTZ1 08	800	LV833635	—	
	MTZ1 12	1200	LV833637	—	
	MTZ1 16	1600	LV839113	—	
MasterPacT MTZ1 UL Drawout Circuit Breakers					
Type N	MTZ1 08	800	LV833781	LV839130	—
	MTZ1 12	1200	LV833783	LV833784	—
Type H	MTZ1 08	800	LV839109	—	
	MTZ1 12	1200	LV839111	—	
Type L	MTZ1 08	800	LV839126	—	
	MTZ1 12	1200	LV839128	—	
Type L1	MTZ1 08	800	LV833947	—	
	MTZ1 12	1200	LV833949	—	
Type LF	MTZ1 08	800	LV839115	—	
	MTZ1 12	1200	LV839117	—	
MasterPacT MTZ1 UL Fixed Automatic Switches					
Type HF	MTZ1 08	800	LV834039	—	—
	MTZ1 12	1200	LV834041	—	—
	MTZ1 16	1600	LV839119	—	—
Type HB	MTZ1 08	800	LV839120	—	—
	MTZ1 12	1200	LV839122	—	—
	MTZ1 16	1600	LV839124	—	—
MasterPacT MTZ1 UL Drawout Automatic Switches					
Type HF	MTZ1 08	800	LV834043	—	—
	MTZ1 12	1200	LV834045	—	—
Type HB	MTZ1 08	800	LV839121	—	—
	MTZ1 12	1200	LV839123	—	—

MasterPacT MTZ2 UL489 Circuit Breakers

			Catalog Number		
			3P	4P	4P RHN
MasterPacT MTZ2 UL Fixed Circuit Breakers					
Type N	MTZ2 08	800	LV864637	LV864638	LV838844
	MTZ2 12	1200	LV864641	LV864642	LV838846
	MTZ2 16	1600	LV864643	LV864644	LV838848
Type H	MTZ2 08	800	LV864659	LV864660	LV864695
	MTZ2 12	1200	LV864663	LV864664	LV864697
	MTZ2 16	1600	LV864665	LV864666	LV864698
MasterPacT MTZ2 Drawout UL Breakers					
Type N	MTZ2 08	800	LV864647	LV864648	LV838845
	MTZ2 12	1200	LV864651	LV864652	LV838847
	MTZ2 16	1600	LV864653	LV864654	LV838849
	MTZ2 20	2000	LV864655	LV864656	LV838851
Type H	MTZ2 08	800	LV864677	LV864678	LV864704
	MTZ2 12	1200	LV864681	LV864682	LV864706
	MTZ2 16	1600	LV864683	LV864684	LV864707
Type L	MTZ2 08	800	LV838881	—	—
	MTZ2 12	1200	LV838883	—	—
	MTZ2 16	1600	LV838885	—	—
	MTZ2 20	2000	LV838887	—	—
	MTZ2 25	2500	LV838889	—	—
	MTZ2 30	3000	LV838891	—	—
Type LF	MTZ2 08	800	LV838917	—	—
	MTZ2 12	1200	LV838919	—	—
	MTZ2 16	1600	LV838921	—	—
	MTZ2 20	2000	LV838923	—	—

MasterPacT MTZ2 UL489 Switches

			Catalog Number		
			3P	4P	4P RHN
MasterPacT MTZ2 UL Fixed Automatic Switches					
Type HB	MTZ2 08	800	LV838898	—	—
	MTZ2 12	1200	LV838900	—	—
	MTZ2 16	1600	LV838902	—	—
	MTZ2 20	2000	LV838904	—	—
	MTZ2 25	2500	LV838906	—	—
	MTZ2 30	3000	LV838908	—	—
Type HF	MTZ2 08	800	LV864755	LV864756	—
	MTZ2 12	1200	LV864757	LV864758	—
	MTZ2 16	1600	LV864759	LV864760	—
	MTZ2 20	2000	LV864761	LV864762	—
	MTZ2 25	2500	LV864763	LV864764	—
	MTZ2 30	3000	LV864765	LV864766	—
MasterPacT MTZ2 UL Drawout Automatic Switches					
Type HB	MTZ2 08	800	LV838899	—	—
	MTZ2 12	1200	LV838901	—	—
	MTZ2 16	1600	LV838903	—	—
	MTZ2 20	2000	LV838905	—	—
	MTZ2 25	2500	LV838907	—	—
	MTZ2 30	3000	LV838909	—	—
Type HF	MTZ2 08	800	LV864771	LV864772	—
	MTZ2 12	1200	LV864773	LV864774	—
	MTZ2 16	1600	LV864775	LV864776	—
	MTZ2 20	2000	LV864777	LV864778	—
	MTZ2 25	2500	LV864779	LV864780	—
	MTZ2 30	3000	LV864781	LV864782	—

MasterPacT MTZ3 UL489 Circuit Breakers

			Catalog Number		
			3P	4P	4P RHN
MasterPacT MTZ3 UL Fixed Circuit Breakers					
Type H	MTZ3 40	4000	LV864673	LV864674	LV864702
	MTZ3 50	5000	LV864675	LV864676	LV864703
	MTZ3 60	6000	LV838852	LV838854	LV838856
MasterPacT MTZ3 UL Drawout Circuit Breakers					
Type H	MTZ3 40	4000	LV864691	LV864692	LV864711
	MTZ3 50	5000	LV864693	LV864694	LV864712
	MTZ3 60	6000	LV838853	LV838855	LV838857
Type L	MTZ3 40	4000	LV838893	—	—
	MTZ3 50	5000	LV838895	—	—
	MTZ3 60	6000	LV838897	—	—

MasterPacT MTZ3 UL489 Switches

			Catalog Number		
			3P	4P	4P RHN
MasterPacT MTZ3 UL Fixed Automatic Switches					
Type HB	MTZ3 40	4000	LV838910	—	—
	MTZ3 50	5000	LV838912	—	—
	MTZ3 60	6000	LV838914	—	—
Type HF	MTZ3 40	4000	LV864767	LV864768	—
	MTZ3 50	5000	LV864769	LV864770	—
	MTZ3 60	6000	LV838874	LV838876	—
MasterPacT MTZ3 UL Drawout Automatic Switches					
Type HB	MTZ3 40	4000	LV838911	—	—
	MTZ3 50	5000	LV838913	—	—
	MTZ3 60	6000	LV838915	—	—
Type HF	MTZ3 40	4000	LV864783	LV864784	—
	MTZ3 50	5000	LV864785	LV864786	—
	MTZ3 60	6000	LV838875	LV838877	—

MasterPacT MTZ IEC 60947-2 Catalog Numbers

MasterPacT MTZ1 IEC 60947-2 Catalog Numbers

			Catalog Number	
			3P	4P
MasterPacT MTZ1 IEC Fixed Circuit Breakers				
Type H1	MTZ1 08	800	LV847120	LV847125
	MTZ1 10	1000	LV847130	LV847135
	MTZ1 12	1250	LV847140	LV847145
	MTZ1 16	1600	LV847150	LV847155
Type H2	MTZ1 08	800	LV847123	LV847128
	MTZ1 10	1000	LV847131	LV847138
	MTZ1 12	1250	LV847141	LV847147
	MTZ1 16	1600	LV847151	LV847157
Type H3	MTZ1 08	800	LV846437	LV846444
	MTZ1 10	1000	LV846438	LV846445
	MTZ1 12	1250	LV846439	LV846446
	MTZ1 16	1600	LV846440	LV846447
Type L1	MTZ1 08	800	LV847122	LV847127
	MTZ1 10	1000	LV847132	LV847137
MasterPacT MTZ1 IEC Drawout Circuit Breakers				
Type H1	MTZ1 08	800	LV847210	LV847215
	MTZ1 10	1000	LV847220	LV847225
	MTZ1 12	1250	LV847230	LV847235
	MTZ1 16	1600	LV847240	LV847245
Type H1	MTZ1 08	800	LV847211	LV847218
	MTZ1 10	1000	LV847221	LV847228
	MTZ1 12	1250	LV847231	LV847237
	MTZ1 16	1600	LV847241	LV847247
Type H3	MTZ1 08	800	LV846451	LV846458
	MTZ1 10	1000	LV846452	LV846459
	MTZ1 12	1250	LV846453	LV846460
	MTZ1 16	1600	LV846454	LV846461
Type L1	MTZ1 08	800	LV847212	LV847217
	MTZ1 10	1000	LV847222	LV847227
MasterPacT MTZ1 IEC Fixed Automatic Switches				
Type HA	MTZ1 08	800	LV847161	LV847162
	MTZ1 10	1000	LV847163	LV847164
	MTZ1 12	1250	LV847165	LV847166
	MTZ1 16	1600	LV847167	LV847168
MasterPacT MTZ1 IEC Drawout Automatic Switches				
Type HA	MTZ1 08	800	LV847250	LV847251
	MTZ1 10	1000	LV847252	LV847253
	MTZ1 12	1250	LV847254	LV847255
	MTZ1 16	1600	LV847256	LV847257

MasterPacT MTZ2 IEC 60947-2 Circuit Breakers

			Catalog Number	
			3P	4P
MasterPacT MTZ2 IEC Fixed Circuit Breakers				
Type N1	MTZ2	800	LV848000	LV848007
	MTZ2	1000	LV848014	LV848021
	MTZ2	1250	LV848028	LV848035
	MTZ2	1600	LV848042	LV848049
	MTZ2	2000	LV848056	LV848063
Type H1	MTZ2	800	LV848001	LV848008
	MTZ2	1000	LV848015	LV848022
	MTZ2	1250	LV848029	LV848036
	MTZ2	1600	LV848043	LV848050
	MTZ2	2000	LV848057	LV848064
	MTZ2	2500	LV848070	LV848076
	MTZ2	3200	LV848082	LV848087
	MTZ2	4000	LV848092	LV848097
Type H2	MTZ2	800	LV848002	LV848009
	MTZ2	1000	LV848016	LV848023
	MTZ2	1250	LV848030	LV848037
	MTZ2	1600	LV848044	LV848051
	MTZ2	2000	LV848058	LV848065
	MTZ2	2500	LV848071	LV848077
	MTZ2	3200	LV848083	LV848088
	MTZ2	4000	LV848093	LV848098
MasterPacT MTZ2 IEC Drawout Circuit Breakers				
Type N1	MTZ2 08	800	LV848230	LV848237
	MTZ2 10	1000	LV848244	LV848251
	MTZ2 12	1250	LV848258	LV848265
	MTZ2 16	1600	LV848272	LV848279
	MTZ2 20	2000	LV848286	LV848293
Type H1	MTZ2 08	800	LV848231	LV848238
	MTZ2 10	1000	LV848245	LV848252
	MTZ2 12	1250	LV848259	LV848266
	MTZ2 16	1600	LV848273	LV848280
	MTZ2 20	2000	LV848287	LV848294
	MTZ2 25	2500	LV848300	LV848306
	MTZ2 32	3200	LV848312	LV848317
	MTZ2 40	4000	LV848322	LV848327
Type H2	MTZ2 08	800	LV848232	LV848239
	MTZ2 10	1000	LV848246	LV848253
	MTZ2 12	1250	LV848260	LV848267
	MTZ2 16	1600	LV848274	LV848281
	MTZ2 20	2000	LV848288	LV848295

MasterPacT MTZ2 IEC 60947-2 Circuit Breakers (Continued)

			Catalog Number	
			3P	4P
	MTZ2 25	2500	LV848301	LV848307
	MTZ2 32	3200	LV848313	LV848318
	MTZ2 40	4000	LV848323	LV848328
Type H3	MTZ2 20	2000	LV848289	LV848296
	MTZ2 25	2500	LV848302	LV848308
	MTZ2 32	3200	LV848314	LV848319
	MTZ2 40	4000	LV848324	LV848329
Type L1	MTZ2 08	800	LV848233	LV848240
	MTZ2 10	1000	LV848247	LV848254
	MTZ2 12	1250	LV848261	LV848268
	MTZ2 16	1600	LV848275	LV848282
	MTZ2 20	2000	LV848290	LV848297

MasterPacT MTZ2 IEC 60947-2 Switches

			Catalog Number	
			3P	4P
MasterPacT MTZ2 IEC Fixed Non Automatic Switches				
Type NA	MTZ2 08	800	LV848004	LV848011
	MTZ2 10	1000	LV848018	LV848025
	MTZ2 12	1250	LV848032	LV848039
	MTZ2 16	1600	LV848046	LV848053
Type HA	MTZ2 08	800	LV848005	LV848012
	MTZ2 10	1000	LV848019	LV848026
	MTZ2 12	1250	LV848033	LV848040
	MTZ2 16	1600	LV848047	LV848054
	MTZ2 20	2000	LV848061	LV848068
	MTZ2 25	2500	LV848074	LV848080
	MTZ2 32	3200	LV848085	LV848090
	MTZ2 40	4000	LV848095	LV848100
MasterPacT MTZ2 IEC Drawout Non-Automatic Switches				
Type NA	MTZ2 08	800	LV848234	LV848241
	MTZ2 10	1000	LV848248	LV848255
	MTZ2 12	1250	LV848262	LV848269
	MTZ2 16	1600	LV848276	LV848283
Type HA	MTZ2 08	800	LV848235	LV848242
	MTZ2 10	1000	LV848249	LV848256
	MTZ2 12	1250	LV848263	LV848270
	MTZ2 16	1600	LV848277	LV848284
	MTZ2 20	2000	LV848291	LV848298
	MTZ2 25	2500	LV848304	LV848310
	MTZ2 32	3200	LV848315	LV848320

MasterPacT MTZ2 IEC 60947-2 Switches (Continued)

			Catalog Number	
			3P	4P
	MTZ2 40	4000	LV848325	LV848330
Type HA10	MTZ2 08	800	LV848745	LV848755
	MTZ2 10	1000	LV848746	LV848756
	MTZ2 12	1250	LV848747	LV848757
	MTZ2 16	1600	LV848748	LV848758
	MTZ2 20	2000	LV848749	LV848759
	MTZ2 25	2500	LV848750	LV848760
	MTZ2 32	3200	LV848751	LV848761
	MTZ2 40	4000	LV848752	LV848762

MasterPacT MTZ3 IEC 60947-2 Circuit Breakers

			Catalog Number	
			3P	4P
MasterPacT MTZ3 IEC Fixed Circuit Breakers				
Type H1	MTZ3 40	4000	LV848106	LV848109
	MTZ3 50	5000	LV848112	LV848115
	MTZ3 63	6300	LV848118	LV848121
Type H2	MTZ3 40	4000	LV848107	LV848110
	MTZ3 50	5000	LV848113	LV848116
	MTZ3 63	6300	LV848119	LV848122
MasterPacT MTZ3 IEC Drawout Circuit Breakers				
Type H1	MTZ3 40	4000	LV848336	LV848339
	MTZ3 50	5000	LV848342	LV848345
	MTZ3 63	6300	LV848348	LV848351
Type H2	MTZ3 40	4000	LV848337	LV848340
	MTZ3 50	5000	LV848343	LV848346
	MTZ3 63	6300	LV848349	LV848352

MasterPacT MTZ3 IEC 60947-2 Switches

			Catalog Number	
			3P	4P
MasterPacT MTZ3 IEC Fixed Non-Automatic Switches				
Type HA	MTZ3 40	4000	LV848108	LV848111
	MTZ3 50	5000	LV848114	LV848117
	MTZ3 63	6300	LV848120	LV848123
MasterPacT MTZ3 IEC Drawout Non-Automatic Switches				
Type HA	MTZ3 40	4000	LV848338	LV848341
	MTZ3 50	5000	LV848344	LV848347
	MTZ3 63	6300	LV848350	LV848353

MasterPacT MTZ Arcblok ANSI C37/UL1066

MasterPacT MTZ2 Arcblok ANSI C37/UL1066 Devices

			Catalog Number	
			3P	4P
MasterPacT MTZ2 ANSI Drawout Arcblok Circuit Breakers				
Type N1	MTZ2 08	800	LV839167	—
	MTZ2 16	1600	LV839168	—
Type H1	MTZ2 08	800	LV839169	—
	MTZ2 16	1600	LV839170	—
	MTZ2 20	2000	LV839171	—
	MTZ2 32	3200	LV839172	—
Type H2	MTZ2 08	800	LV839179	—
	MTZ2 16	1600	LV839180	—
	MTZ2 20	2000	LV839181	—
	MTZ2 32	3200	LV839182	—
Type H3	MTZ2 08	800	LV839184	—
	MTZ2 16	1600	LV839185	—
	MTZ2 20	2000	LV839186	—
	MTZ2 32	3200	LV839187	—
Type L1	MTZ2 08	800	LV839194	—
	MTZ2 16	1600	LV839195	—
	MTZ2 20	2000	LV839196	—
Type L1F	MTZ2 08	800	LV839200	—
	MTZ2 16	1600	LV839201	—
	MTZ2 20	2000	LV839202	—
MasterPacT MTZ2 ANSI Drawout Arcblok Circuit Breakers				
MasterPacT MTZ2 ANSI Drawout Arcblok Non-Automatic Switches				
Type HA	MTZ2 08	800	LV839174	—
	MTZ2 16	1600	LV839175	—
	MTZ2 20	2000	LV839176	—
	MTZ2 32	3200	LV839177	—
MasterPacT MTZ2 ANSI Drawout Arcblok Non-Automatic Switches				
Type HF	MTZ2 08	800	LV839189	—
	MTZ2 16	1600	LV839190	—
	MTZ2 20	2000	LV839191	—
	MTZ2 32	3200	LV839192	—
Type HC	MTZ2 08	800	LV839197	—
	MTZ2 16	1600	LV839198	—
	MTZ2 20	2000	LV839199	—

MasterPacT MTZ3 Arcblok ANSI C37/UL1066 Devices

			Catalog Number	
			3P	4P
MasterPacT MTZ2 ANSI Drawout Arcblok Circuit Breakers				
Type H2	MTZ3 40	4000	LV839307	—
	MTZ3 50	5000	LV839308	—
Type H3	MTZ3 40	4000	LV839311	—
	MTZ3 50	5000	LV839312	—
Type L1	MTZ3 32	3200	LV839315	—
	MTZ3 40	4000	LV839316	—
	MTZ3 50	5000	LV839317	—
MasterPacT MTZ3 ANSI Drawout Arcblok Non-Automatic Switches				
Type HA	MTZ3 40	4000	LV839309	—
	MTZ3 50	5000	LV839310	—
MasterPacT MTZ3 ANSI Drawout Arcblok Automatic Switches				
Type HF	MTZ3 40	4000	LV839313	—
	MTZ3 50	5000	LV839314	—
Type HC	MTZ3 32	3200	LV839318	—
	MTZ3 40	4000	LV839319	—
	MTZ3 50	5000	LV839320	—

MasterPacT MTZ Arcblok ANSI UL 489

MasterPacT MTZ2 Arcblok ANSI UL 489 Devices

			Catalog Number	
			3P	4P
MasterPacT MTZ2 UL Drawout Arcblok Circuit Breakers				
Type N	MTZ2 08	800	LV839135	—
	MTZ2 12	1200	LV839136	—
	MTZ2 16	1600	LV839137	—
	MTZ2 20	2000	LV839138	—
Type H	MTZ2 08	800	LV839139	—
	MTZ2 12	1200	LV839140	—
	MTZ2 16	1600	LV839141	—
	MTZ2 20	2000	LV839142	—
	MTZ2 25	2500	LV839143	—
	MTZ2 30	3000	LV839144	—
Type L	MTZ2 08	800	LV839151	—
	MTZ2 12	1200	LV839152	—
	MTZ2 16	1600	LV839153	—
	MTZ2 20	2000	LV839154	—
	MTZ2 25	2500	LV839155	—
	MTZ2 30	3000	LV839156	—
Type LF	MTZ2 08	800	LV839163	—
	MTZ2 12	1200	LV839164	—
	MTZ2 16	1600	LV839165	—
MasterPacT MTZ2 UL Drawout Arcblok Automatic Switches				
Type HF	MTZ2 08	800	LV839145	—
	MTZ2 12	1200	LV839146	—
	MTZ2 16	1600	LV839147	—
	MTZ2 20	2000	LV839148	—
	MTZ2 25	2500	LV839149	—
	MTZ2 30	3000	LV839150	—
Type HB	MTZ2 08	800	LV839157	—
	MTZ2 12	1200	LV839158	—
	MTZ2 16	1600	LV839159	—
	MTZ2 20	2000	LV839160	—
	MTZ2 25	2500	LV839161	—
	MTZ2 30	3000	LV839162	—

MasterPacT MTZ3 Arcblok ANSI UL 489 Devices

			Catalog Number	
			3P	4P
MasterPacT MTZ2 UL Drawout Arcblok Automatic Switches				
Type HF	MTZ2 08	800	LV839145	—
	MTZ2 12	1200	LV839146	—
	MTZ2 16	1600	LV839147	—
	MTZ2 20	2000	LV839148	—
	MTZ2 25	2500	LV839149	—
	MTZ2 30	3000	LV839150	—
Type HB	MTZ2 08	800	LV839157	—
	MTZ2 12	1200	LV839158	—
	MTZ2 16	1600	LV839159	—
	MTZ2 20	2000	LV839160	—
	MTZ2 25	2500	LV839161	—
	MTZ2 30	3000	LV839162	—
MasterPacT MTZ3 UL Drawout Arcblok Circuit Breaker				
Type H	MTZ3 40	4000	LV839299	—
	MTZ3 50	5000	LV839300	—
Type L	MTZ3 40	4000	LV839303	—
	MTZ3 50	5000	LV839304	—
MasterPacT MTZ3 UL Drawout Arcblok Automatic Switches				
Type HF	MTZ3 40	4000	LV839301	—
	MTZ3 50	5000	LV839302	—
Type HB	MTZ3 40	4000	LV839305	—
	MTZ3 50	5000	LV839306	—

MicroLogic X Control Unit and Digital Modules Catalog Numbers

MicroLogic X Control Unit

Model	Protection	Catalog Number	Additional Features
MicroLogic 3.0 X	LI	LV848815	Digital Modules
MicroLogic 5.0 X	LSI	LV847609	Digital Modules
MicroLogic 6.0 X	LSIG	LV847608	Digital Modules

Sensor Plug

In (A)	Sensor Plug	MTZ1-08 MTZ2-08	MTZ2-16	MTZ2-20	MTZ2-32	MTZ2-40
400	LV847053SP	◉	—	—	—	—
600	LV848823SP	◉	—	—	—	—
630	LV833091SP	◉	◉	—	—	—
800	LV833092SP	◉	◉	—	—	—
1000	LV833093SP	—	◉	◉	—	—
1200	LV848824SP	—	◉	◉	—	—
1250	LV833094SP	—	◉	◉	—	—
1600	LV833095SP	—	◉	◉	◉	—
2000	LV833982SP	—	—	◉	◉	◉
2500	LV833983SP	—	—	—	◉	◉
3000	LV848825SP	—	—	—	◉	◉
3200	LV833984SP	—	—	—	◉	◉
3600	LV836390SP	—	—	—	—	◉
4000	LV847820SP	—	—	—	—	◉
2000	LV847821SP	—	—	—	—	—
2500	LV847822SP	—	—	—	—	—
3000	LV848826SP	—	—	—	—	—
3200	LV847823SP	—	—	—	—	—
3600	LV836391SP	—	—	—	—	—
4000	LV847824SP	—	—	—	—	—
5000	LV847825SP	—	—	—	—	—
6000	LV848827SP	—	—	—	—	—
6300	LV847826SP	—	—	—	—	—

Digital Modules Option

	3P/4P
Energy per phase	LV850002
Power restoration assistant	LV850004
MasterPacT Operation assistant	LV850005
Wave Form Capture on trip event	LV850003
Individual Harmonics Analysis	LV850006
Energy per phase	LV850002
Power restoration assistant	LV850004
MasterPacT Operation assistant	LV850005
ANSI 32P - Reverse active power protection	LV850011
ANSI 27/59 - Under/Over voltage protection	LV850012
Modbus legacy dataset	LV850045
ERMS - Energy Reducing Maintenance SW	LV850009

Replacement Parts for MicroLogic X Control Units

		Part Number
MicroLogic X embedded display (EHMI)	MicroLogic X embedded display & wireless card	LV850054SP
MicroLogic X Battery + Transparent cover	Battery (1 part)	LV833593SP
	Transparent Cover (1 part)	LV850053SP
Voltage power supply module (VPS) for MicroLogic X		LV850060SP
USB Cable (miniUSB/USB) for MicroLogic X		LV850067SP
Mobile Power Pack for MicroLogic X (by APC)		LV850055SP
ZSI Interface module (restraint interface module)	120 Vac	LV848892SP

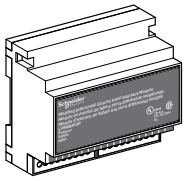
Communication Accessories Catalog Numbers

Monitoring and Control		
		Part Number
EIFE and I/O modules	EIFE Embedded Ethernet module full spare part kit for MTZ1-drawout	LV851100SP
	EIFE Embedded Ethernet module full spare part kit for MTZ2/3-drawout	LV851200SP
	EIFE Embedded Ethernet Spare Part stand-alone module for MTZ1/2/3-drawout	LV851001SP
	Ethernet interface LV breaker	LV434001
	Ethernet interface for LV breakers and gateway	LV434002
	I/O application module	LV434063
	EIFE Wire Accessories spare part kit for MTZ1-drawout	LV851120SP
	EIFE Wire Accessories spare part kit for MTZ2/3-drawout	LV851220SP
ULP port modules	ULP port - for MasterPacT MTZ1 - fixed	LV850063SP
	ULP port - for MasterPacT MTZ1 - drawout	LV850064SP
	ULP port - for MasterPacT MTZ2/3 - fixed	LV850061SP
	ULP port - for MasterPacT MTZ2/3 - drawout	LV850062SP
Ethernet display module	Front display module FDM128	LV434128
ULP wiring accessories [1]	Breaker ULP cord L = 0.35 m	LV434195
	Breaker ULP cord L = 1.3 m	LV434196
	Breaker ULP cord L = 3 m	LV434197
	5 RJ45 connectors female/female	TRV00870
	10 ULP line terminators	TRV00880
	10 RJ45/RJ45 male cord L = 0.3 m	TRV00803
	10 RJ45/RJ45 male cord L = 0.6 m	TRV00806
	5 RJ45/RJ45 male cord L = 1 m	TRV00810
	5 RJ45/RJ45 male cord L = 2 m	TRV00820
	5 RJ45/RJ45 male cord L = 3 m	TRV00830
	1 RJ45/RJ45 male cord L = 5 m	TRV00850

Neutral Sensors Catalog Numbers

External Sensor for Neutral Ground-Fault Protection (TCE)

External Sensor for
Source Ground-Return Protection



MDGF

Neutral Sensor Parts

		Catalog Number
Neutral Sensor Wiring Harness for MTZ1/2		LV848907SP
Neutral Sensor Wiring Harness for MTZ3		LV848906SP
MDGF/SGR (Source Ground Return) Sensor plug	External sensor (SGR)[66]	LV833579SP
	MDGF summing module for MTZ2/3	LV848891SP

MasterPacT MTZ1 External Neutral Sensors

Used With	Sensor Plug	External Neutral Sensor For General Use
Circuit breakers with standard neutral protection	400–1600 A	LV833576SP
Circuit breakers with oversized neutral protection[67]	400–1000 A	LV833576SP
	1200–1250A	LV834035SP
	1600A	LV834036SP

66. Four MDGF sensors (phase + 1 neutral) are required for MTZ2; eight MDGF sensors are required for MTZ3. For SGR system only one sensor (neutral) is required for MTZ2; two sensors for MTZ3.
67. Oversized neutral protection = 1.6 Ir where Ir = long time pick-up.

MasterPacT MTZ2/MTZ3 External Neutral Sensors

<table>
<tr><th colspan="2" rowspan="2">Description</th><th colspan="2">External Neutral Sensor</th></tr>
<tr><th>For Residual Ground Fault</th><th>For 3P Circuit Breaker with Oversized Neutral Protection[68]</th></tr>
<tr><td colspan="4">MasterPacT MTZ2 Circuit Breakers</td></tr>
<tr><td rowspan="12">Sensor Plug</td><td>400</td><td rowspan="5">LV834037SP</td><td rowspan="4">LV834037SP</td></tr>
<tr><td>600–630</td></tr>
<tr><td>800</td></tr>
<tr><td>1000</td></tr>
<tr><td>1200–1250</td><td>LV834035SP</td></tr>
<tr><td>1600</td><td rowspan="3">LV834036SP</td><td rowspan="2">LV834036SP</td></tr>
<tr><td>2000</td><td>LV834035SP</td></tr>
<tr><td>2500</td><td rowspan="4">LV834036SP</td><td rowspan="4">—</td></tr>
<tr><td>3000</td></tr>
<tr><td>3200</td></tr>
<tr><td>4000</td></tr>
<tr><td colspan="4">MasterPacT MTZ3 Circuit Breakers</td></tr>
<tr><td rowspan="8">Sensor Plug
Kit includes qty. (2) neutral sensors</td><td>2000</td><td rowspan="8">LV848182SP</td><td rowspan="5">LV848182SP</td></tr>
<tr><td>2500</td></tr>
<tr><td>3000</td></tr>
<tr><td>3200</td></tr>
<tr><td>4000</td></tr>
<tr><td>5000</td><td rowspan="3">—</td></tr>
<tr><td>6000</td></tr>
<tr><td>6300</td></tr>
</table>

68. Oversized neutral protection = 1.6 Ir where Ir = long time pick-up.

Auxiliary, Alarm Contacts and Power Supply Catalog Numbers

Auxiliary and Alarm Contacts, Programmable Contact Module, Electrical Close Pushbutton

Combined Contacts

Additional Overcurrent Trip Indication Contacts (SDE)

Microswitch Type ON/OFF Indication Contacts (OF) (MTZ1)

MasterPacT Electrical Closing Pushbutton (BPFE)

Accessory	Catalog Number	
	MTZ1	MTZ2/MTZ3
1a/1b Form C Auxiliary Switch	LV847076SP	—
Low Level 1a/1b Form C Auxiliary Switch	LV847077SP	—
4a/4b Form C Auxiliary Switch (OF)	—	LV864922SP
1a/1b Form C Connected/Closed Switch (EF)	—	LV848477SP
Low Level 1a/1b Form C Connected/Closed Switch (EF)	—	LV848478SP
1a/1b Form C Second Trip Alarm Switch (SDE2)	LV847915SP	LV847915SP
Low Level 1a/1b Form C Second Trip Alarm Switch	LV847916SP	LV847916SP
1a/1b Form C Ready-to-Close Switch (PF)	LV847080SP	LV847080SP
Low Level 1a/1b Form C Ready-to-Close Switch	LV847081SP	LV847081SP
Electrical Close Pushbutton (BPFE)	LV864917SP	LV848534SP

Cradle Position Switches (Cell Switches)

Description	Catalog Number
1a/1b Form C Connected/Test/Disconnected Switch	LV833170SP
Low Level 1a/1b Form C Connected/Test/Disconnected Switch	LV833171SP
1a Connected/Test/Disconnected Switch MTZ2-3 (Ring Tongue)	LV839289SP
1b Connected/Test/Disconnected Switch MTZ2-3 (Ring Tongue)	LV839290SP
Set of 3 Cell Switch Actuating Arms	LV848560SP

NOTE: Auxiliary, alarm and status switches' terminal blocks need to be ordered separately, see Secondary Terminal Block Kits, below.

Secondary Terminal Block Kits

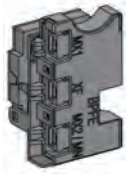
	Fixed MTZ1/2/3	Drawout MTZ1	Drawout MTZ2/3
Push-in Terminal kit (3 Wires)	LV847074SP	LV833098SP	LV847849SP
Push-in Terminal kit (6 Wires)	LV847075SP	LV833099SP	LV847850SP
Ring Tongue Kit 1a MTZ2-3	—	—	LV839296SP
Ring Tongue Kit 1b MTZ2-3	—	—	LV839297SP
Ring Tongue Kit 1a & 1b MTZ2-3	—	—	LV839298SP

Accessories for MicroLogic X Control Units

		Catalog Number
External power supply module (AD)	24–30 Vdc	LV454440
	48–60 Vdc	LV454441
	100–125 Vdc	LV454442
	110–130 Vdc	LV454443
	200–240 Vdc	LV454444

Shunt Close, Shunt Trip, and Undervoltage Release Catalog Numbers

Shunt Close, Shunt Trip, Undervoltage Trip



Isolation Module

Description			Catalog Number
Shunt Close (XF) or Shunt Trip (MX) for all MasterPacT MTZ Devices			
Standard coil	AC 50/60 Hz DC	24 Vac, 24–30 Vdc	LV833659SP
		48 Vac,m 48–60 Vdc	LV833660SP
		100–130 Vac/dc	LV833661SP
		200–250 Vac/dc	LV833662SP
		277 Vac	LV833663SP
		380–480 Vac	LV833664SP
Diagnostics & Communicating coil [69]	AC 50/60 Hz DC	24 Vac, 24–30 Vdc,	LV833033SP
		48 Vac, 48–60 Vdc	LV833034SP
		100–130 Vac/dc	LV833035SP
		200–250 Vac/dc	LV833036SP
		277 Vac	LV833037SP
		380–480 Vac	LV833038SP
		Wiring kit for diag & com coil for MTZ1	LV833118SP
		Wiring kit for diag & com coil for MTZ2/3	LV847904SP
Terminal block	For fixed circuit breaker MTZ1/2/3		LV847074SP
	For drawout circuit breaker MTZ1		LV833098SP
	For drawout circuit breaker MTZ2/3		LV847849SP
Undervoltage Release MN for all MTZ			
Undervoltage release	AC 50/60 Hz DC	24–30 Vdc, 24 Vac	LV833668SP
		48–60 Vdc, 48 Vac	LV833668SP
		100–130 Vac/dc	LV833669SP
		200–250 Vac/dc	LV833670SP
		380–480 Vac	LV833671SP
Diagnostics coil[69]	AC 50/60 Hz DC	24–30 Vdc, 24 Vac	LV833673SP
		48–60 Vdc, 48 Vac	LV836668SP

69. Diagnostic and electrical accessories (MX, XF) are required for remote functioning of the MasterPacT Operation Assistant Digital Module.

Description			Catalog Number
		100–130 Vac/dc	LV836670SP
		200–250 Vac/dc	LV836671SP
		380–480 Vac	LV836673SP
		Wiring kit for diag & com coil for MTZ1	LV833118SP
		Wiring kit for diag & com coil for MTZ2/3	LV847904SP
Terminal block	For fixed circuit breaker MTZ1/2/3		LV847074SP
	For drawout circuit breaker MTZ1		LV833098SP
	For drawout circuit breaker MTZ2/3		LV847849SP
Accessories for Diagnostics & Communicating Accessories			
Isolation module for MicroLogic X—for MX1/XF communicating accessories			LV850056SP
Voltage release tab/bracket for MX/XF/MN			LV847093SP

Spring Charging Motor and Remote Accessories Catalog Numbers

Spring Charging (MCH) for MasterPacT MTZ1 Devices

Spring Charging Motor (MCH) for MasterPacT MTZ2 and MTZ3 Devices

Remote Racking Device

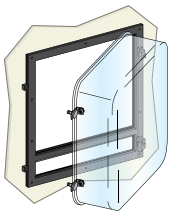
Remote Operation

			Catalog Number
Spring Charging Motor for MTZ1			
Spring Charging Motor (MCH)	AC 50/60 Hz	48 V	LV833186SP
		100–130 V	LV833176SP
		200–240 V	LV833177SP
		277 V	LV833179SP
		380–415 V	LV833179SP
		440–480 V	LV833179SP
	DC	24–30 V	LV833185SP
		48–60 V	LV833186SP
		100–125 V	LV833187SP
		200–250 V	LV833188SP
	Terminal block	For fixed circuit breaker	LV847074SP
		For drawout circuit breaker	LV833098SP
Spring Charging Motor for MTZ2/3			
Spring Charging Motor (MCH)	AC 50/60 Hz	48 V	LV847889SP
		100–130 V	LV847893SP
		200–240 V	LV847894SP
		277 V	LV847895SP
		380–415 V	LV847895SP
		380–415 V	LV847896SP
		440–480 V	LV847897SP
	DC	24–30 V	LV847888SP
		48–60 V	LV847889SP
		100–125 V	LV847890SP
		200–250 V	LV847891SP
	Terminal block	For fixed circuit breaker	LV847074SP
		For drawout circuit breaker	LV847849SP
Remote reset after fault trip	Electrical reset RES	110–130 V AC	LV848202SP
		220–240 V AC	LV848203SP
	Terminal block	For fixed circuit breaker MTZ1/2/3	LV847074SP
		For drawout circuit breaker MTZ1	LV833098SP
		For drawout circuit breaker MTZ2/3	LV847849SP
MasterPacT MTZ Circuit Breaker Remote Racking			
Description	MasterPacT MTZ1/2/3 Remote Racking Device		LV839291SP
	MasterPacT MTZ2/3 Remote Racking Device		LV839292SP
	MasterPacT MTZ1 Remote Racking Device		LV839293SP
	Mounting Bracket Kit for MTZ2/3 Remote Racking (contains 10 mounting brackets)		LV839294SP
	Mounting Bracket Kit for MTZ1 Remote Racking (contains 10 mounting brackets)		LV839295SP

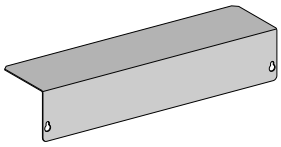
Remote Operation (Continued)

		Catalog Number
	Control Unit for MTZ1/2/3 Remote Racking[70]	S47101
	30 ft. Control Cable for MTZ1/2/3 Remote Racking[70]	S47102
	Drive Shaft for MTZ2/3 Remote Racking[70]	S47103
	Drive Shaft for MTZ1 Remote Racking[70]	S47105

Miscellaneous Accessory Catalog Numbers



Transparent Cover for Escutcheon. (CCP)



Terminal Cover (CB)

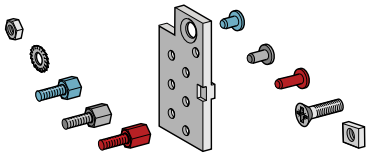
Escutcheon

Description		Catalog Number	
		Fixed	Drawout
Escutcheon			
MasterPacT MTZ1	Escutcheon	LV833718SP	LV833857SP
	Transparent cover (IP54)	—	LV833859SP
MasterPacT MTZ2/3	Escutcheon	LV848601SP	LV848603SP
	Transparent cover (IP 54)	—	LV848604SP
Grounding Kit KTM			
MasterPacT MTZ2/3	Side plate kit	LV848556SP	LV848557SP

70. For replacement only

Mechanical Operation Counter (CDM)

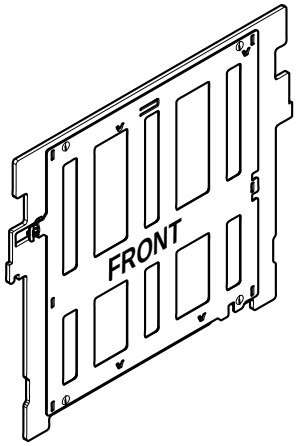
Door Interlock Catch (VPEC)



Cradle Rejection Kit

Mechanical Operation Counter / Door Interlock / Cradle Rejection Kit

	Catalog Number	
	MTZ1	MTZ2/MTZ3
Operation counter CDM	LV833895SP	LV848535SP
Racking handle / 1 part	LV847098SP	LV847944SP
Spring charging handle	LV847092SP	LV847940SP
Door Interlock—Right and left-hand side of cradle (VPECD or VPECG)	LV833172SP	LV847914SP
Cradle rejection kit (VDC)	S33767	NWCELLKEY



Shutter

Assorted Accessories

		Catalog Number
ANSI C37/UL 1066/UL 489 Safety Shutters 1 part for MTZ		
MTZ1	3P	S48933
	4P	S48934
MTZ2 800/4000 A	3P	65346
	4P	65347
MTZ3 4000/6000 A	3P	65348
	4P	65349
Cluster Shield for Drawout Circuit Breakers		
ANSI Circuit Breakers	UL Circuit Breakers	
MTZ 08N1 / H1 / H2 / H3	MTZ 08N / H	65356
MTZ 08L1 / L1F	MTZ 08L / LF, MTZ 12L / LF	65357
MTZ 16N1 / H1 / H2 / H3	MTZ 16N / H	65356
MTZ L1F	MTZ 16L / LF	65357
MTZ 20H1 / H2 / H3	MTZ 20N / H	65356
MTZ 20L1 / L1F	MTZ 20LF	65357
—	MTZ 20L, MTZ 25H/ L	65356
MTZ 32H1 / H2 / H3	MTZ 30H / L MTZ 40BH	65356
MTZ 32L1	—	65356
MTZ 40H2 / H3	MTZ 40H	65356
MTZ 40L1	MTZ 40H / L	65356
MTZ 50H2 / H3	MTZ 50H	65356
MTZ 50L1	MTZ 50L	65356
MTZ 60H2 / H3	MTZ 60H	65356
MTZ 60L1	MTZ 60L	65356
Defeat Tool		
Cradle Interlock Defeat tool		64274
Cluster Tools		
Finger Cluster		S33166
Cluster Grease		S48899
Cluster Positioning Tool		S47542
Cluster Reset Tool		CLUSRETOOL
Cluster Service Kit		CLUSTOOLSK
Lifting Device Kits		
Crossbar for MTZ2 / NW-W frame Circuit Breaker or Cradle		S48900
Crossbar for MTZ3 / NW-Y-Frame Circuit Breaker or Cradle		S48901
Set of Two Lifting Hooks		S48906

Cradle Metering CT Kit Catalog Numbers

For use with UL and ANSI rated circuit breakers only.
Not available with ArcBlok Technology.

Cradle Metering CT Kit (Set of 3)

Description		Catalog Number
MTZ2	400 A	SMCT400
	600 A	SMCT600
	800 A	SMCT800
	1200 A	SMCT1200
	1600 A	SMCT1600
	2000 A	SMCT2000
	2000 A	SMCT2000R[71]
	2500 A	SMCT2500R
	3000 A	SMCT3000R
	3200 A	SMCT3200R
MTZ3	2000 A	SMCT2000Y
	2500 A	SMCT2500Y
	3000 A	SMCT3000Y
	3200 A	SMCT3200Y
	4000 A	SMCT4000Y
	5000 A	SMCT5000Y
	6000 A	SMCT6000Y

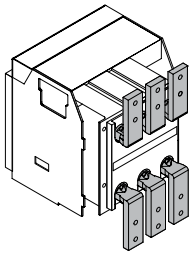
71. For MTZ2 20L1/L circuit breaker only

Interlocks Catalog Numbers

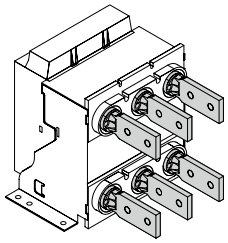
Description		Catalog Number
Door Interlock		
Door interlock MTZ1	Right and left-hand side of cradle (VPECD or VPECG)	LV833172SP
Door interlock MTZ2/3	Right and left-hand side of cradle (VPECD or VPECG)	LV847914SP
Cable-type door interlock	1 complete assembly for MasterPacT MTZ2/MTZ3 fixed or drawout device	LV848614SP
Mechanical Interlocking for Source Changeover for MTZ2/3		
Interlocking of 2 devices using connecting rods Choose 1 set of 2 adaptation fixtures (1 for each device) + 1 set of rods	Rod Interlock kit: 1 set of 2 adaptation fixtures for MasterPacT MTZ2 or MTZ3 fixed or drawout device	LV847930SP
	1 set of 2 interlocking rods	LV833210SP
	Can be used with 1 MTZ2/3 fixed + 1 MTZ2/3 drawout. Note: the installation manual is enclosed. Interlocking of 2 devices using cables [1]	
Interlocking of 2 devices using cables [1] Choose 2 adaptation sets (1 for each device + 1 set of cables)	1 adaptation fixture for MasterPacT MTZ2/3 fixed devices	LV847926SP
	Cable mouinting plate: 1 adaptation fixture for MasterPacT MTZ2/3 drawout devices	LV847926SP
	Cable interlock: 1 set of 2 cables	LV833209SP
Interlocking of 3 devices using cables Choose 3 adaptation (including 3 adaptation fixtures + cables)	3 sources, only 1 device closed, fixed or drawout devices	LV848610SP
	2 sources + 1 coupling, fixed or drawout devices	LV848609SP
	2 normal + 1 replacement source, fixed or drawout devices	LV848608SP

UL/ANSI Connectors Catalog Numbers

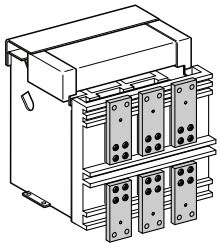
NOTE: For a 4-pole connector kit, add the suffix (4) to the kit number (e.g. SFCF124)



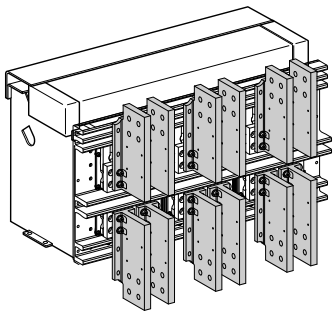
MTZ1 Drawout Front-Connected Flat (FCF)
800 to 1200 A



MTZ1 FixedRear-Connected “T” Vertical (RCTV)
800 to 1200 A



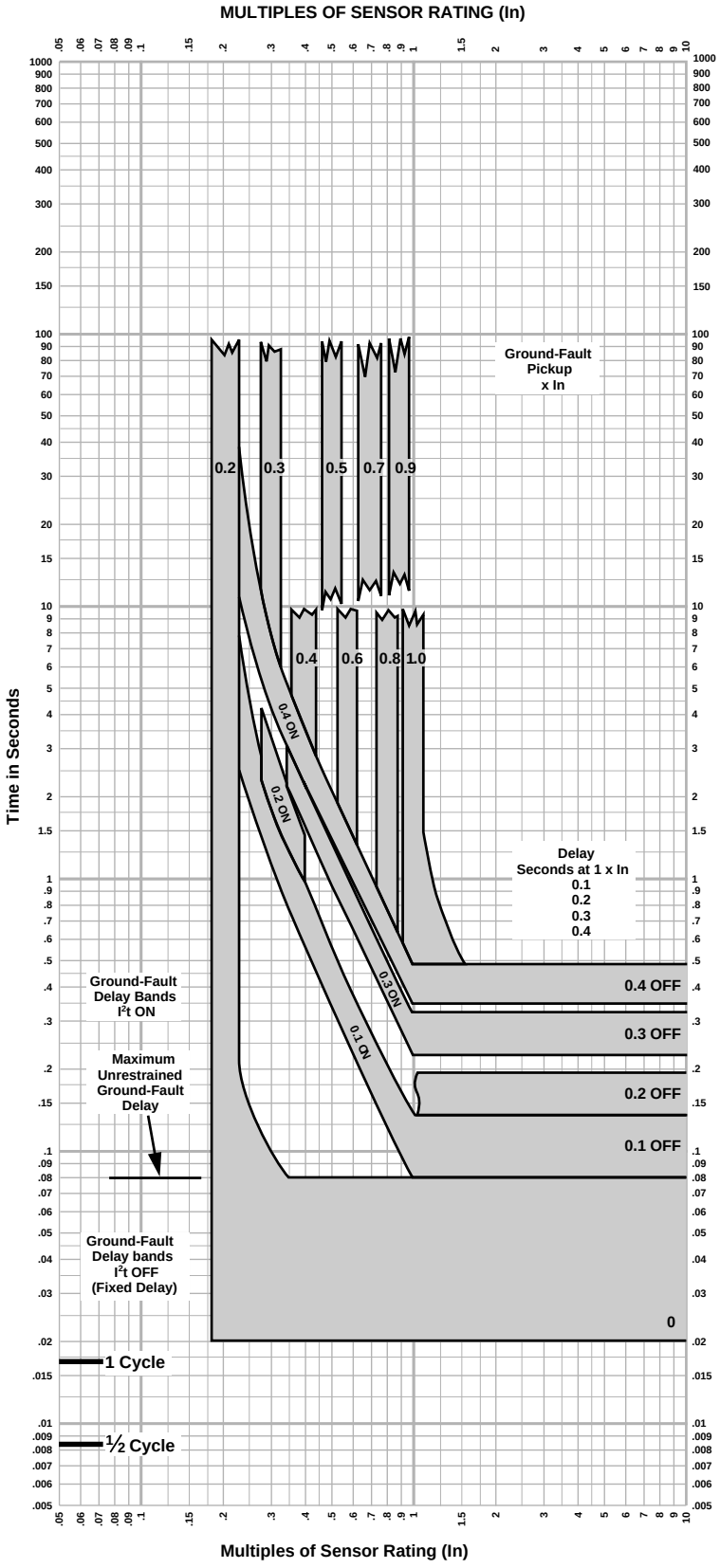
MTZ2 Front-Connected Flat (FCF)



MTZ3 Front-Connected “T” (FCT)

Device	Connector	Frame		Catalog Number
MasterPacT MTZ1	Front Connected Flat (FCF)	800–1200A	Top	SFCF12
			Bottom	SFCF12
	Rear Connected T Horizontal/ Vertical (RCTH/RCTV)	800–1200A	Top	SRCTV12
			Bottom	SRCTV12
MasterPacT MTZ2/3	Front Connected Flat (FCF)	800–2000A, Drawout circuit breaker only	Top	SFCF20T
			Bottom	SFCF20B
		800–2000A, Fixed circuit breaker only	Top	SFCF20FT
			Bottom	SFCF20FB
		3200 A (L1/L1F only) 4000 A	Top	SFCF40
			Bottom	SFCF40
	Front Connected T (FCT)	800–2000 A Drawout circuit breaker only	Top	SFCT30
			Bottom	SFCT30
		800–2000 A Fixed circuit breaker only	Top	SFCT30
			Bottom	SFCT30B
		3200 A (for L1/L1F only), 4000 A, 5000 A	Top	SFCT50
			Bottom	SFCT50
	Rear Connected Offset Vertical (RCOV)	2000 A (for L1/L1F only)	Top	SRCOV32T
		3200 A	Bottom	SRCOV32B
		4000 A (For MTZ2 4000 A only)	Top	SRCOV40
			Bottom	SRCOV40
		4000 A Fixed MTZ2 only)	Top	SRCOV40BFX
			Bottom	SRCOV40BFX
	Rear Connected T Horizontal/ Vertical (RCTH/RCTV)	800-2000 A	Top	SRCTV20
			Bottom	SRCTV20
		3200 A (for L1/L1F only), 4000 A, 5000 A	Top	SRCTV50
			Bottom	SRCTV50
		6000 A	Top	SRCTV60
			Bottom	SRCTV60

MicroLogic X Control Unit Tripping Curves

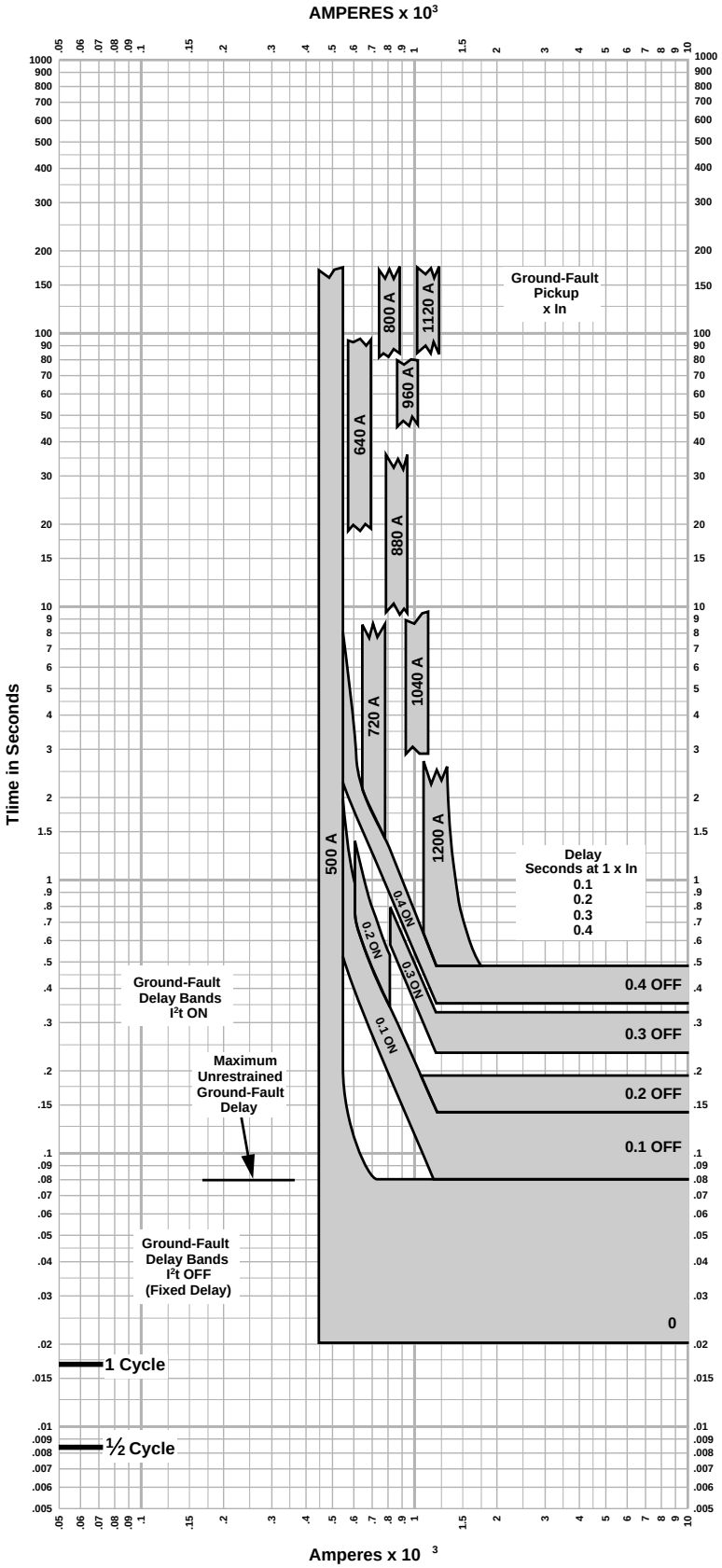


MicroLogic 6.0 X Control Unit With Adjustable Ground-Fault Pickup and Delay

Ground-fault I^2t OFF and ON
400 A < In ≤ 1200 A

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

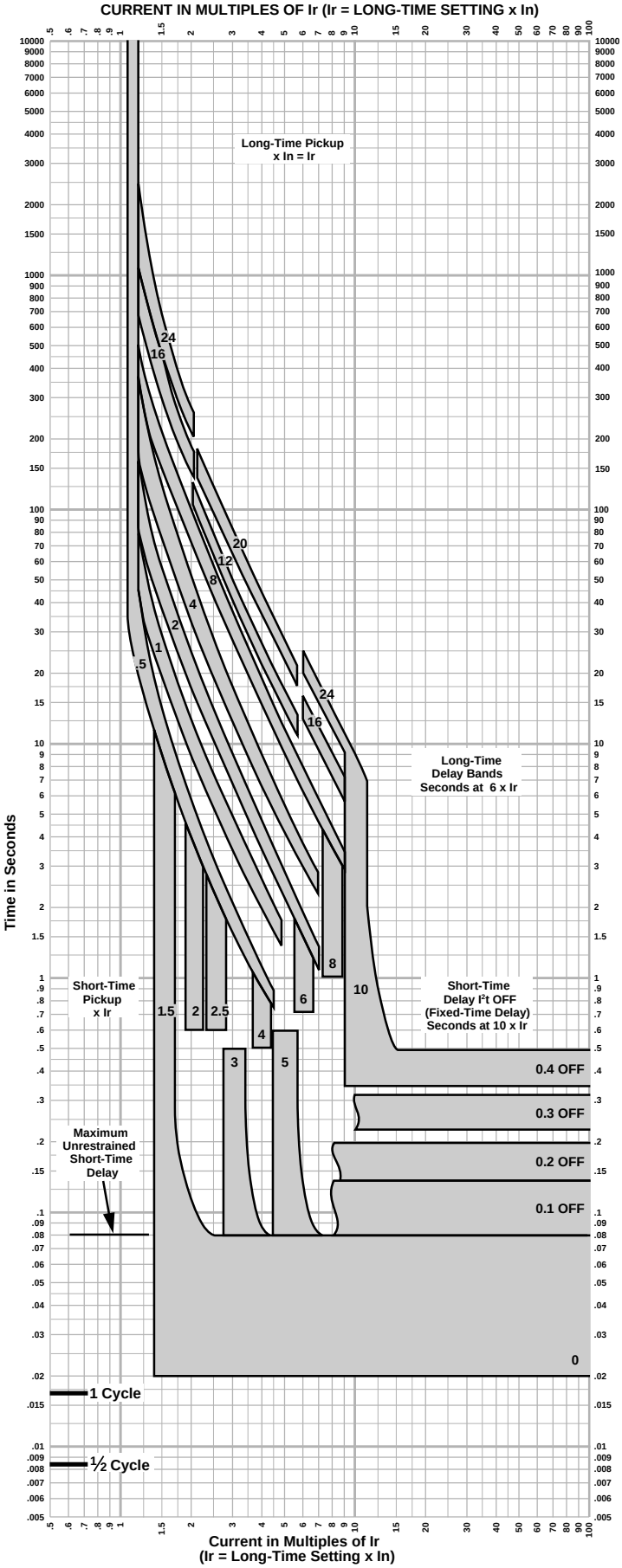


MicroLogic 6.0 X Control Unit With Adjustable Ground-Fault Pickup and Delay

Ground-fault I^2t OFF and ON
In > 1200 A

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.



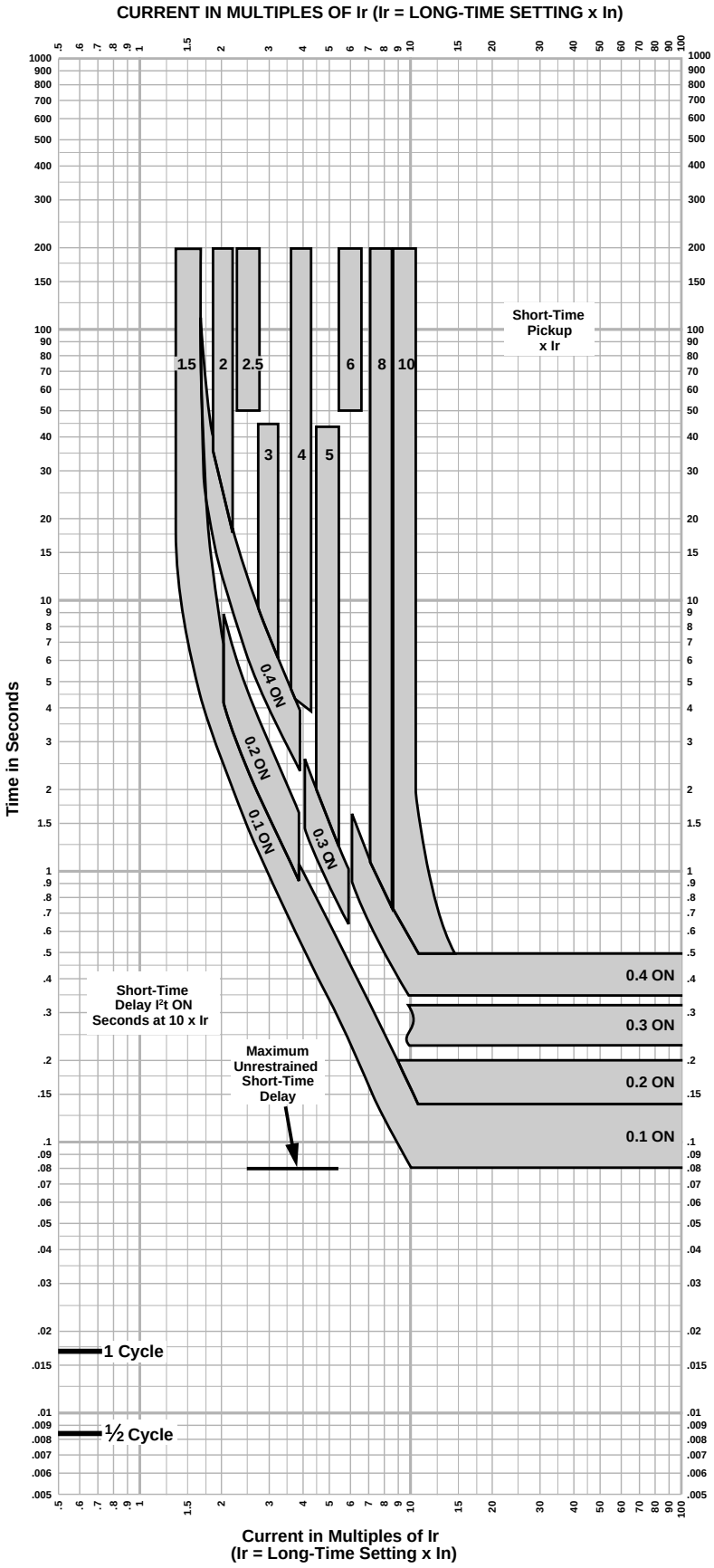
MicroLogic 5.0/6.0 X Control Unit
Long-time Pickup and Delay
Short-time Pickup and I²t OFF Delay

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking on, short-time delay utilized and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF.



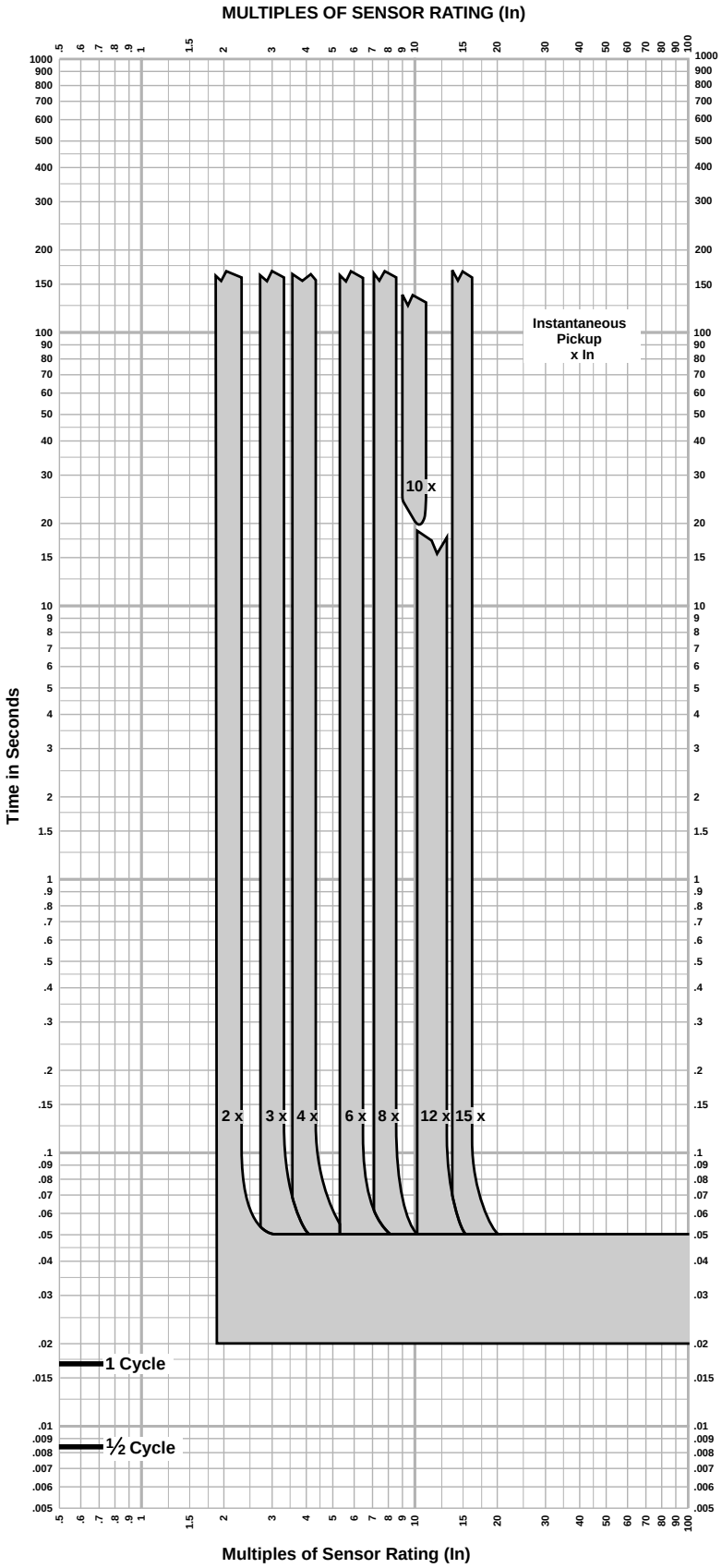
MicroLogic 5.0/6.0 X Control Unit Short-time Pickup and I²t ON Delay

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selective interlocking on, short-time delay utilized and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF.



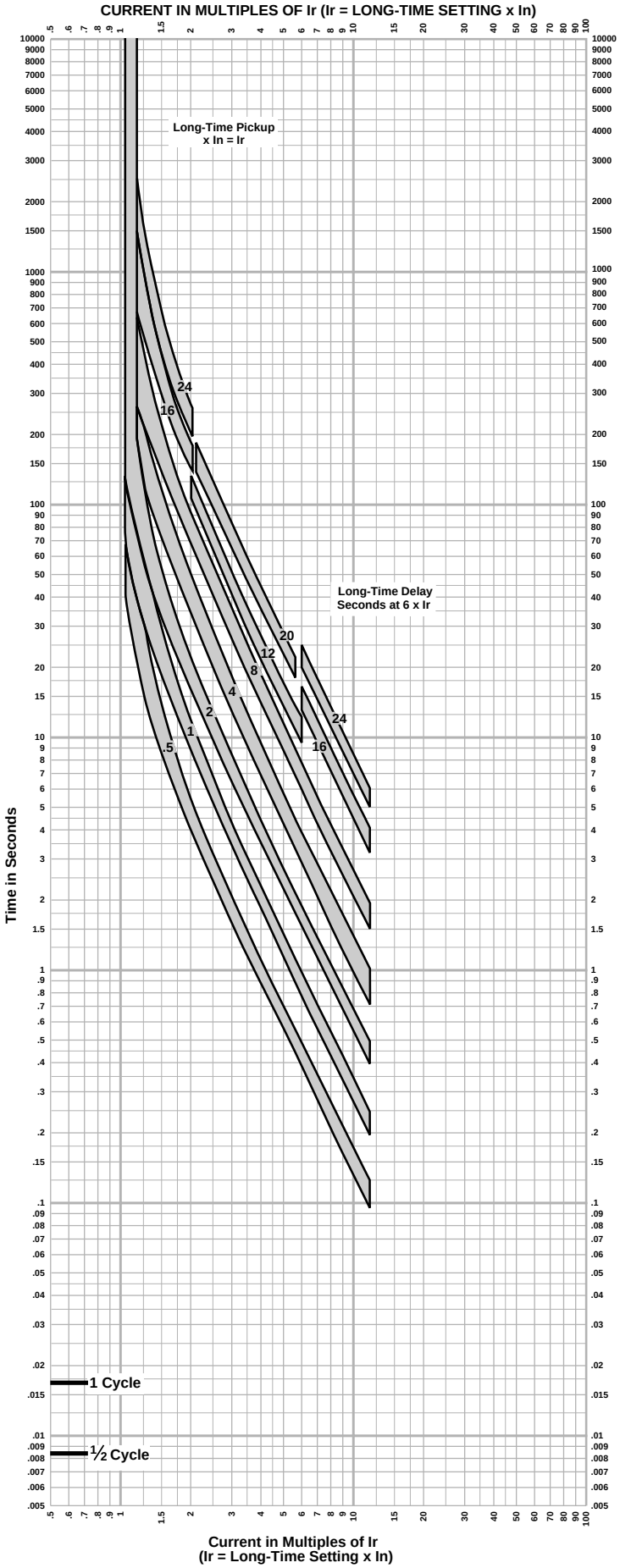
MicroLogic 5.0/6.0 X Control Unit
Instantaneous Pickup
2x–15x and OFF

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local Sales Office for additional information.
4. For a withstand circuit breaker, instantaneous can be turned OFF.



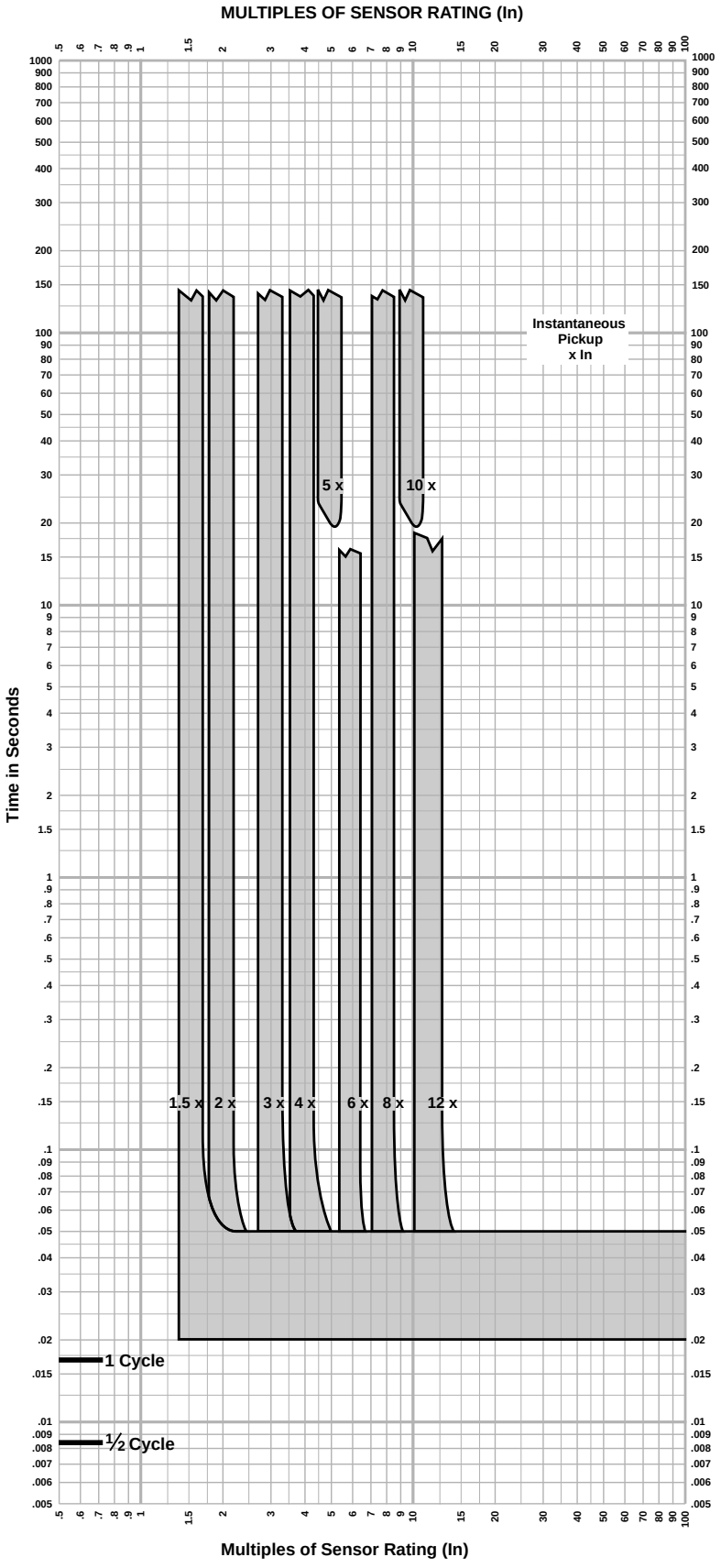
MicroLogic 3.0 X Control Unit Long-time Pickup and Delay

The time-current curve information is to be used for application and coordination purposes only.

Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal-imaging effect comes into play if a current above the long-time delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in a shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the instantaneous setting.
3. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.



MicroLogic 3.0 X A Control Unit
Instantaneous Pickup
1.5x-12x

The time-current curve information is to be used for application and coordination purposes only.

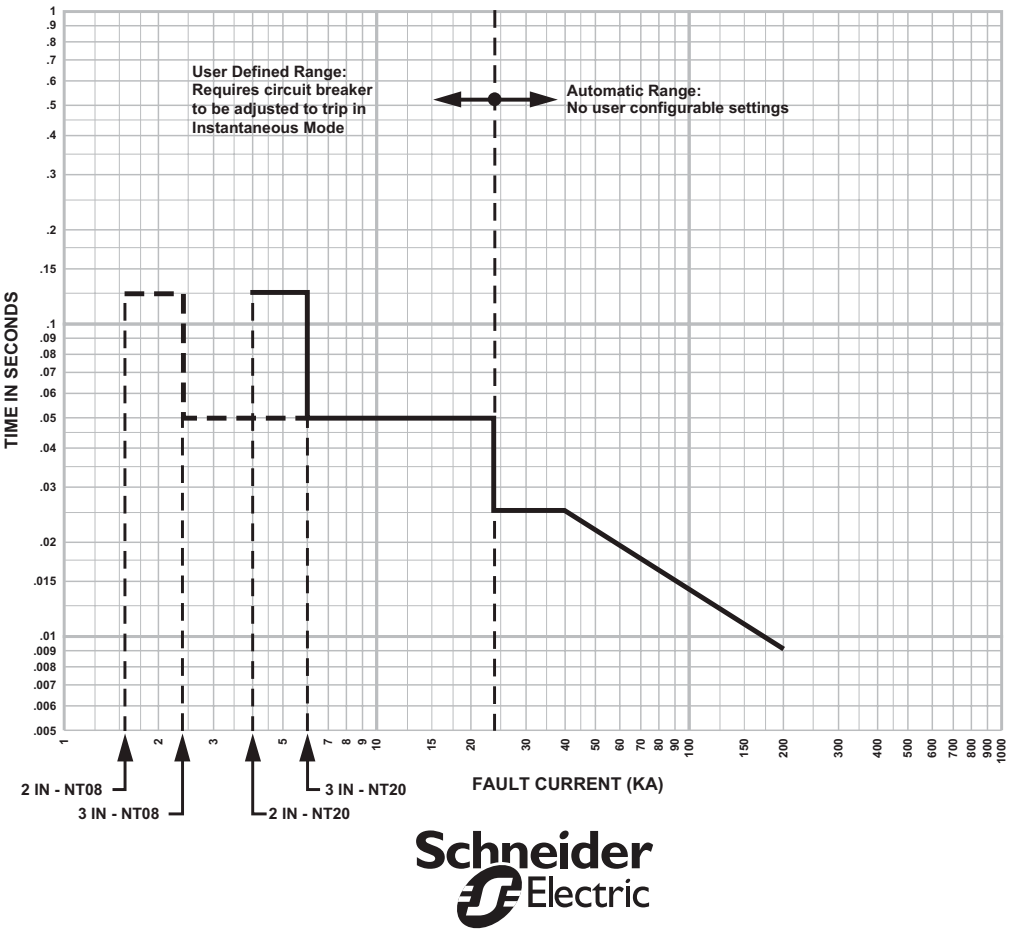
Curves apply from -25°C to +70°C (-13°F to +158°F) ambient temperature.

Instantaneous override values are given on 613-10.

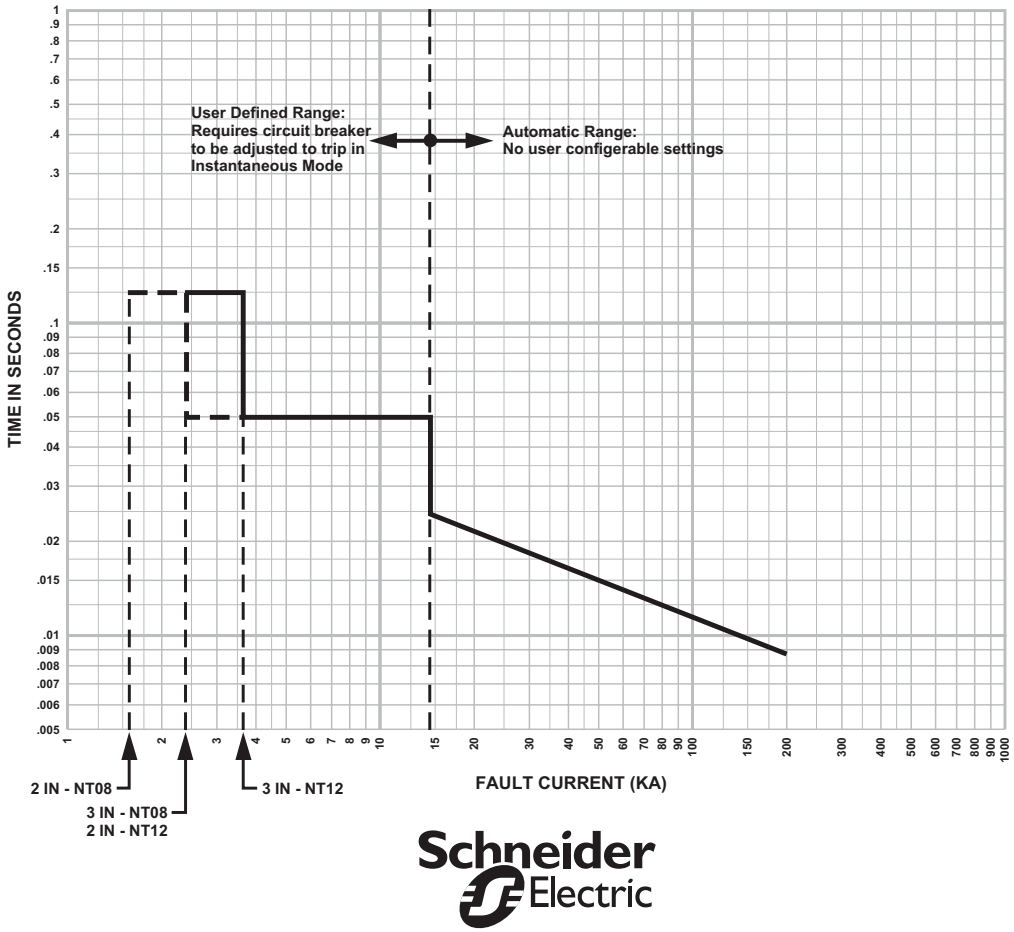
Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated. Contact your local Sales Office for additional information.

MasterPact MTZ2/MTZ3 Low Arc Flash Circuit Beaker
Characteristic Trip Curve No. 613-15
(L1F and LF) 800–2000 A, 60 Hz



Masterpact MTZ1 Low Arc Flash Circuit Breaker
Characteristic Trip Curve No. 613-16
(L1F and LF) 800–1200 A, 60 Hz



Instantaneous Override Values

MicroLogic X Control Unit Instantaneous Override Values

MasterPacT MTZ

ANSI CB Model No.	Inst. Override (kA Peak) +/- 10%
MTZ2 08N1	None
MTZ2 16N1	None
MTZ2 08H1	None
MTZ2 16H1	None
MTZ2 20H1	None
MTZ2 32H1	None
MTZ2 08H2	None
MTZ2 16H2	None
MTZ2 20H2	None
MTZ2 32H2	None
MTZ2 40H2	None
MTZ2 50H2	None
MTZ2 60H2	None
MTZ2 08H3	190
MTZ2 16H3	190
MTZ2 20H3	190
MTZ2/3 32H3	190
MTZ2/3 40H3	190
MTZ2/3 50H3	190
MTZ2/3 60H3	190
MTZ2/3 08L1	80
MTZ2/3 08L1F	55
MTZ2/3 16L1	80
MTZ2/3 16L1F	55
MTZ2/3 20L1	80
MTZ2/3 20L1F	55
MTZ2/3 32L1	270
MTZ2/3 40L1	270
MTZ2/3 50L1	270
MTZ2/3 60L1	270
MTZ2/3 08HA	None
MTZ2/3 16HA	None
MTZ2/3 20HA	None
MTZ2/3 32HA	None
MTZ2/3 40HA	None
MTZ2/3 50HA	None
MTZ2/3 60HA	None
MTZ2/3 08HF	190
MTZ2/3 16HF	190
MTZ2/3 20HF	190
MTZ2/3 32HF	190
MTZ2/3 40HF	190
MTZ2/3 50HF	190
MTZ2/3 60HF	190
MTZ2/3 08HC	80
MTZ2/3 16HC	80
MTZ2/3 20HC	80
MTZ2/3 32HC	270
MTZ2/3 40HC	270
MTZ2/3 50HC	270
MTZ2/3 60HC	270
MTZ1 08N1	None
MTZ1 08H1	None
MTZ1 08L1F	22
MTZ1 08NA	None

MasterPacT MTZ

UL CB Model No.	Inst. Override (kA Peak) +/- 10%
MTZ2/3 08N	90
MTZ2/3 12N	90
MTZ2/3 16N	90
MTZ2/3 20N	90
MTZ2/3 08H	90
MTZ2/3 12H	90
MTZ2/3 16H	90
MTZ2/3 20H	90
MTZ2/3 25H	150
MTZ2/3 30H	150
MTZ2/3 40H	170
MTZ2/3 50H	170
MTZ2/3 60H	170
MTZ2/3 08L	80
MTZ2/3 08LF	55
MTZ2/3 12L	80
MTZ2/3 12LF	55
MTZ2/3 16L	80
MTZ2/3 16LF	55
MTZ2/3 20L	150
MTZ2/3 20LF	55
MTZ2/3 25L	150
MTZ2/3 30L	150
MTZ2/3 40L	170
MTZ2/3 50L	170
MTZ2/3 60L	170
MTZ2/3 08HF	90
MTZ2/3 12HF	90
MTZ2/3 16HF	90
MTZ2/3 20HF	150
MTZ2/3 25HF	150
MTZ2/3 30HF	150
MTZ2/3 40HF	170
MTZ2/3 50HF	170
MTZ2/3 60H	170
MTZ2/3 08HB	80
MTZ2/3 12HB	80
MTZ2/3 16HB	80
MTZ2/3 20HB	150
MTZ2/3 25HB	150
MTZ2/3 30HB	150
MTZ2/3 40HB	170
MTZ2/3 50HB	170
MTZ2/3 60HB	170
MTZ1 08N	90
MTZ1 12N	90
MTZ1 16N	90
MTZ1 08H	90
MTZ1 12H	90
MTZ1 16H	90
MTZ1 08L1	22
MTZ1 12L1	22
MTZ1 16L1	22
MTZ1 08L	22
MTZ1 08LF	22
MTZ1 12L	22
MTZ1 16L	22
MTZ1 12LF	22
MTZ1 08HF	90
MTZ1 12HF	90

MasterPacT MTZ

IEC CB Model No.	Inst. Override (kA Peak) +/- 10%
MTZ2/3 08N1	None
MTZ2/3 10N1	None
MTZ2/3 12N1	None
MTZ2/3 16N1	None
MTZ2/3 08H1	None
MTZ2/3 10H1	None
MTZ2/3 12H1	None
MTZ2/3 16H1	None
MTZ2/3 20H1	None
MTZ2/3 25H1	None
MTZ2/3 32H1	None
MTZ2/3 40H1	None
MTZ2/3 40bH1	None
MTZ2/3 50H1	None
MTZ2/3 63H1	None
MTZ2/3 08H2	190
MTZ2/3 10H2	190
MTZ2/3 16H2	190
MTZ2/3 20H2	190
MTZ2/3 25H2	190
MTZ2/3 32H2	190
MTZ2/3 40H2	190
MTZ2/3 40bH2	190
MTZ2/3 50H2	270
MTZ2/3 63H2	270
MTZ2/3 20H3	150
MTZ2/3 25H3	150
MTZ2/3 32H3	150
MTZ2/3 40H3	150
MTZ2/3 08L1	80
MTZ2/3 10L1	80
MTZ2/3 12L1	80
MTZ2/3 16L1	80
MTZ2/3 20L1	80
MTZ2/3 08H10	None
MTZ2/3 10H10	None
MTZ2/3 12H10	None
MTZ2/3 16H10	None
MTZ2/3 20H10	None
MTZ2/3 25H10	None
MTZ2/3 32H10	None
MTZ2/3 40H10	None
MTZ2/3 08NA	None
MTZ2/3 10NA	None
MTZ2/3 16NA	None
MTZ2/3 08HA	None
MTZ2/3 10HA	None
MTZ2/3 12HA	None
MTZ2/3 16HA	None
MTZ2/3 20HA	None
MTZ2/3 25HA	None
MTZ2/3 32HA	None
MTZ2/3 40HA	None
MTZ2/3 40bHA	None
MTZ2/3 50HA	None
MTZ2/3 63HA	None

MasterPacT MTZ

IEC CB Model No.	Inst. Override (kA Peak) +/- 10%
MTZ2/3 08HF	190
MTZ2/3 10HF	190
MTZ2/3 12HF	190
MTZ2/3 16HF	190
MTZ2/3 20HF	190
MTZ2/3 25HF	190
MTZ2/3 32HF	190
MTZ2/3 40HF	190
MTZ2/3 08HA10	None
MTZ2/3 10HA10	None
MTZ2/3 12HA10	None
MTZ2/3 16HA10	None
MTZ2/3 20HA10	None
MTZ2/3 25HA10	None
MTZ2/3 32HA10	None
MTZ2/3 40HA10	None
MTZ1 08H1	None
MTZ1 10H1	None
MTZ1 12H1	None
MTZ1 16H1	None
MTZ1 08L1	22
MTZ1 08H10	None
MTZ1 10H10	None
MTZ1 12H10	None
MTZ1 16H10	None
MTZ1 08HA	None
MTZ1 10HA	None
MTZ1 12HA	None
MTZ1 16HA	None
MTZ1 08HA10	None
MTZ1 10HA10	None
MTZ1 12HA10	None
MTZ1 16HA10	None

Note:
Faults at or above instantaneous override value will be cleared at 25 msec or less.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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