

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.

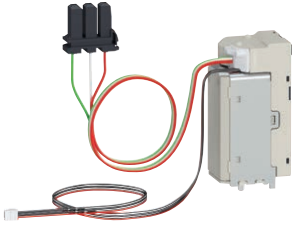
- When the voltage drops by 35 to 70% of its rated voltage, MN diag will open the circuit breaker automatically.
- When MX diag&com does not receive the order or does not open the circuit breaker after receiving the order, MN diag can be triggered to open the circuit breaker.

	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 trip 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 Ecoreach 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 prevent incorrect wiring and operation.

Communication Function

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

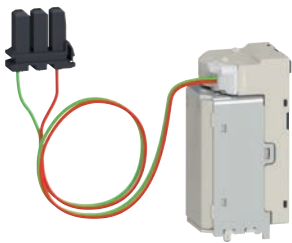
This allows the coils to be integrated in the communication system. Providing flexibility for remote operations, and the diagnostic function's results can be assessed remotely as well.

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

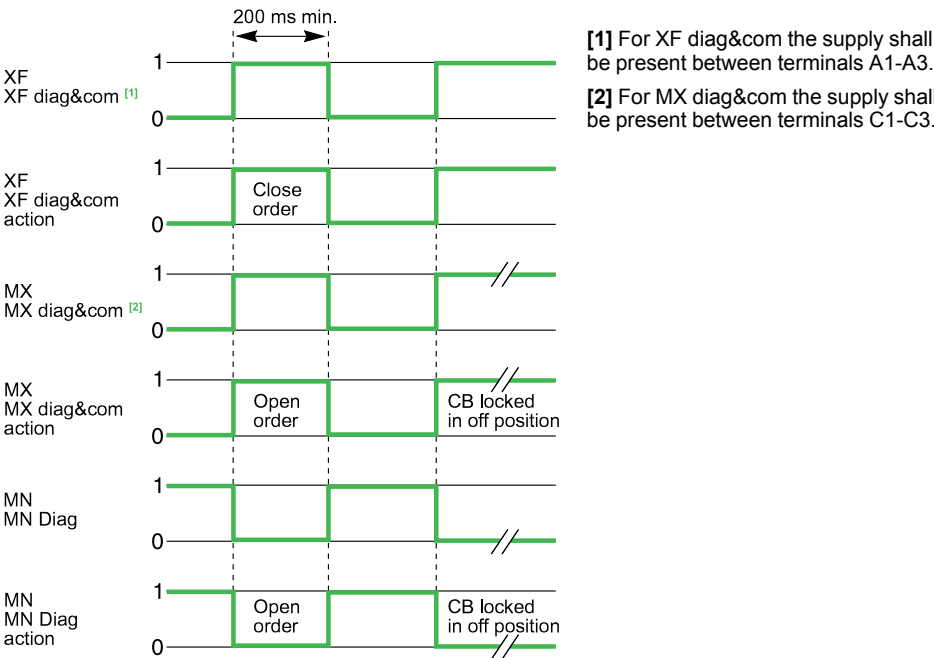
When signalled, the shunt close (XF) and shunt trip (MX) instantaneously triggers the mechanism to close/open the circuit breaker. The undervoltage trip (MN) also opens the circuit breaker when its supply voltage drops to a value between 35% and 70% of its rated voltage. Circuit breaker closing is possible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



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

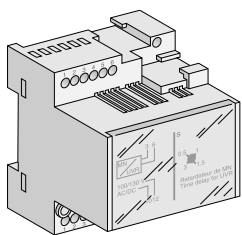
Characteristics		MN, MN diag
Power Supply	Vac 50/60 Hz	24 - 48 - 100/130 - 200/250 - 380/480
	Vdc	24/30 - 48/60 - 100/130 - 200/250
Operating Threshold	Opening	0.35 to 0.7 Vn
	Closing	0.85 Vn
Consumption (VA or W)		Hold: 4.5
		Pick-up: 200 (200 ms)
MN Consumption with Delay Unit (VA or W)		Hold: 4.5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

Recommended Maximum Cable Lengths

		12 V		24 V		48 V	
		2.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²
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)



Adjustable or non-adjustable delay unit

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.

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

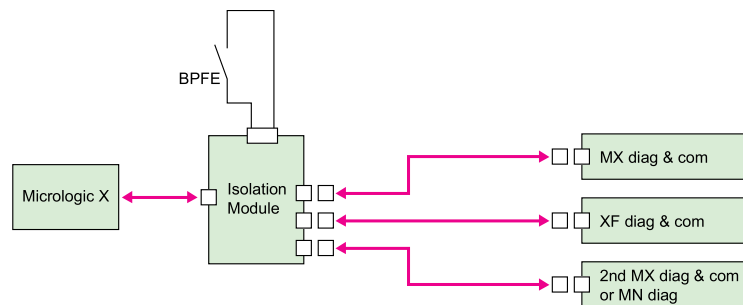


Isolation Module

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.