

DETROIT DIESEL SUBSTATION REPLACEMENT PH 1

Approval Drawing Package

Factory Order #: 51900946

04/24/2026

Ryan Weiss
Project Manager
North American Operating Division
559-214-5853
ryan.weiss@se.com

Life Is On



TABLE OF CONTENTS

LOW VOLTAGE SWITCHGEAR

BILL OF MATERIALS AND DRAWINGS

M1-C

LITERATURE

Power-Zone 4 Front Accessible Switchgear - Brochure

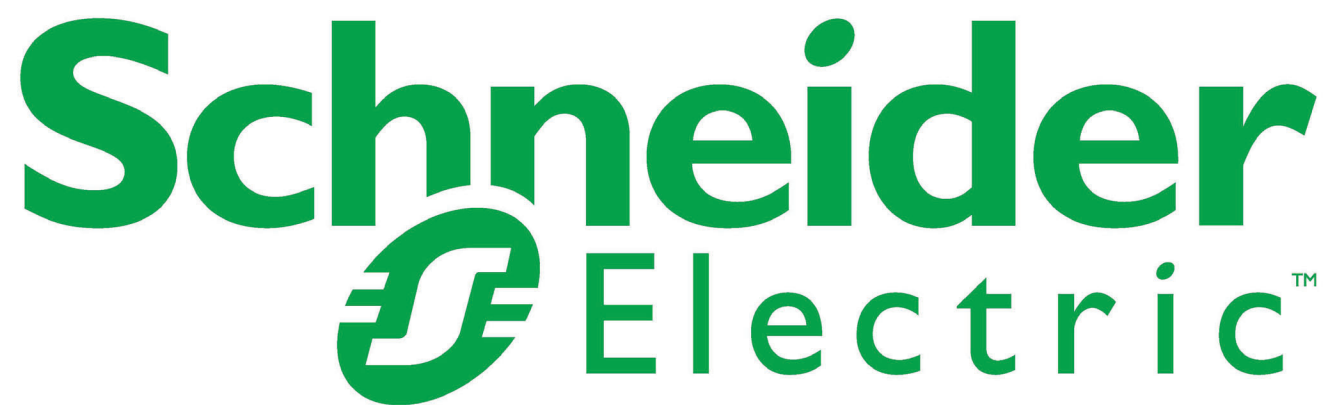
Internal Modular SPDs (Internally Mounted) - Brochure

PowerLogic PM5000 Series - Technical Datasheet

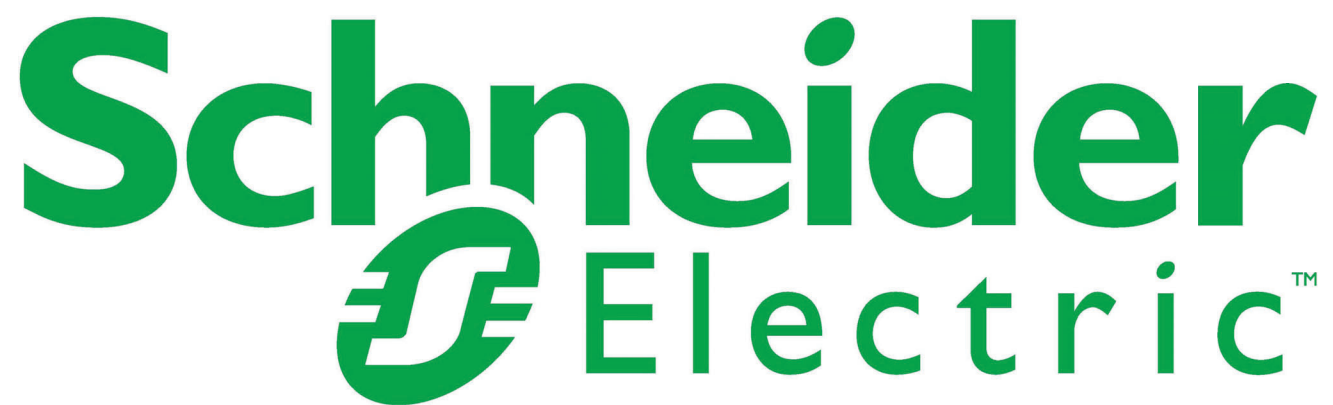
Masterpact MTZ Circuit Breakers

Micrologic X Control Unit

Masterpact MTZ Circuit Breakers - Energy Reducing Maintenance Settings Module



LOW VOLTAGE SWITCHGEAR



BILL OF MATERIALS AND DRAWINGS



Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO

Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026

ERP Line #	Qty	Product Description
000010	1	Designation : M1-C Product Details: LOW VOLTAGE SWITCHGEAR 1-POWER-ZONE 4 SWITCHGEAR COMMS-LOW VOLTAGE SWITCHGEAR Lineup with MTZ Micrologic X Breakers with Smart System Communications Network 2.0 Main(M1)-Tie-Tie-Main(M2) - End Fed 480/277V,3PH-4W,60HZ 3200A Copper Main Bus Solidly Grounded Neutral 100% Neutral Two - 15KVA Control Power Transformers 65kA Maximum Available Fault Current 80" Deep Enclosure Indoor NEMA 1 Style Enclosure ANSI 49 Exterior Color Paint Network Communications with Device Web Pages (IFE/Meter) Ethernet Modbus TCP Customer RJ45 Connection Breakers (Masterpact) on Modbus RS485 Serial Network connected to Ethernet Modbus TCP Interface All devices pre-wired and pre-tested to the customer connection Control Power Transfer Manually Operated Overhead Lifting Device Humidistat White Back Pans Certified Test Reports Extra Breaker Grease - 1 Tube Remote Control Pendant Station Set of Spare Fuses ENCLOSURE OPTIONS 6 - 22" Wide section(s) with 3200A, Thermal Rated, Silver Plated Horizontal Bus, 4W, 100%N 2 - Bus Isolation Barriers 6 - Bus Compartment Side Barriers 7 - Locking Hinged Rear Doors 7 - Bottom Plates (including Rodent Protection) 7 - Gasketing on Doors and Sections 7 - Plastic Mimic Bus - Black 7 - Strip Heaters in Bus Compartment 7 - Strip Heaters in Cable Compartment 7 - Drip Hood (field installed by others) 6 - Cable Compartment Side Barriers 2 - Top and Bottom Infrared Viewing Window for Feeder Load Connections scanning only: 3 inch Diameter 2 - Bottom Infrared Viewing Window for Feeder Load Connections scanning only: 3 inch Diameter 1 - 22", 3200A, 4W, 100%N, Indoor Bussed Auxiliary Section INCOMING ONE: CONNECTIONS & METERING OPTIONS Connected to Liquid Type Transformer Liquid Transformer is Located on the Left Side Transformer Connection Type - Throat 3200A 4W Connection to Square D Liquid Transformer 3200A UL Service Entrance Label MAIN ONE: CIRCUIT BREAKER 3200A, MTZ2-32H1, Electrically Operated Main Breaker DESCRIPTION: MB-1 Micrologic X Unit (6.0X), LSIG Communications Module & Wiring - Main/Tie

NOTE: Secondary 120ka/ph surge protection
device will need to be added.

NOTE: PM8244 Power Meter will be changed
to PM5563 Power Meter

BLUE TOOTH AND WIRELESS CONTROL
FUNCTIONS TO BE REMOVED OR
DISABLED. OUTPUT MONITORING IS
THE ONLY FUNCTION ALLOWED OUT
OF THE SWITCHGEAR.

BREAKER LIFT CART



**Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO**

**Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026**

Micrologic X Digital Module - ERMS
Sensor Plug Rating - 3200A
Trip Setting (Amps) - 3200
Plug for Remote Pendant Station
Separate Breaker Control Switch
Energy Reduction Maintenance Switch -
Locally Mounted
Power Meter - PM8244RD in line up with
communications
Push-to-Test Lights (Status Lights - Fault
Status)
4A Form C Contacts Auxiliary Switch
Special Wiring to Instrumentation
Compartment - Cell Switches
Shunt Close - Electrically Operated Main
Modified Differential Ground Fault - Main
Shutters Over Bus in Cell
Shunt Trip - Electrically Operated Main
Closing Coil (XF) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Open/Close Pushbutton Lock - Main
Shunt Trip Coil (MX1) 120Vac
2 Kirk Key Interlocks on Main Breaker
Spring Charging Motor (MCH) 120Vac
Special Wiring to Instrumentation
Compartment - Auxiliary Switches
Breaker Padlock Attachment on Circuit
Breaker
Push-to-Test Lights (Status Lights -
Open/Close)
Breaker ID Nameplate - Main
Strip Heaters in Breaker Compartment
Status Indicating Lights - Open/Close
Status Indicating Lights - Trip
Metering CTs
Cell - 1 BC

INCOMING 1 FEEDER BREAKERS & INSTRUMENTATION

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close

Strip Heaters in Breaker Compartment
Cell - 2 A
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 2 B
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close



**Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO**

**Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026**

Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 2 C
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 2 D
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly

Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 3 D
Load Side Power Direction - Cable (Bottom)

TIE
3200A, MTZ2-32H1, Electrically Operated Tie
Breaker
DESCRIPTION: Tie breaker
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Main/Tie
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 3200A
Trip Setting (Amps) - 3200
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
4A Form C Contacts Auxiliary Switch
Push-to-Test Lights (Status Lights - Fault
Status)
Status Indicating Lights - Open/Close
Special Wiring to Instrumentation
Compartment - Cell Switches
Modified Differential Ground Fault - Tie
Push-to-Test Lights (Status Lights - Ready
to Close)
Open/Close Pushbutton Lock - Tie
Spring Charging Motor (MCH) 120Vac
Status Indicating Lights - Trip
1 Kirk Key Interlock on Tie Breaker
Shunt Close - Electrically Operated Tie
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Ready to Close Switch (PF)
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Special Wiring to Instrumentation
Compartment - Auxiliary Switches
Status Indicating Lights - Ready to Close
Breaker ID Nameplate - Tie
Push-to-Test Lights (Status Lights -
Open/Close)
Strip Heaters in Breaker Compartment
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip - Electrically Operated Tie
Shutters Over Bus in Cell
Cell - 3 BC

TIE 2
3200A, MTZ2-32H1, Electrically Operated Tie
Breaker
DESCRIPTION: 2nd Tie breaker
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Main/Tie
Modbus RS485 Serial Communication to
Breaker/Cradle
Sensor Plug Rating - 3200A
Trip Setting (Amps) - 3200
Plug for Remote Pendant Station
4A Form C Contacts Auxiliary Switch
2 Kirk Key Interlocks on Tie Breaker
Modified Differential Ground Fault - Tie
Spring Charging Motor (MCH) 120Vac



**Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO**

**Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026**

Shunt Close - Electrically Operated Tie
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Ready to Close Switch (PF)
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Breaker ID Nameplate - Tie
Strip Heaters in Breaker Compartment
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip - Electrically Operated Tie
Shutters Over Bus in Cell
Cell - 5 BC
Special Records:
Qty. 01 per Device - Remove Trip Unit for
Dummy Plg - (TAG TR-143897)

INCOMING TWO: CONNECTIONS & METERING OPTIONS

Connected to Liquid Type Transformer
Liquid Transformer is Located on the Right
Side
Transformer Connection Type - Throat
3200A 4W Connection to Square D Liquid
Transformer
3200A UL Service Entrance Label

MAIN TWO: CIRCUIT BREAKER

3200A, MTZ2-32H1, Electrically Operated
Main Breaker
DESCRIPTION: MB-2
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Main/Tie
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 3200A
Trip Setting (Amps) - 3200
Plug for Remote Pendant Station
Separate Breaker Control Switch
Energy Reduction Maintenance Switch -
Locally Mounted
Power Meter - PM8244RD in line up with
communications
Push-to-Test Lights (Status Lights - Fault
Status)
4A Form C Contacts Auxiliary Switch
Special Wiring to Instrumentation
Compartment - Cell Switches
Shunt Close - Electrically Operated Main
Modified Differential Ground Fault - Main
Shutters Over Bus in Cell
Shunt Trip - Electrically Operated Main
Closing Coil (XF) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Open/Close Pushbutton Lock - Main
Shunt Trip Coil (MX1) 120Vac
2 Kirk Key Interlocks on Main Breaker
Spring Charging Motor (MCH) 120Vac
Special Wiring to Instrumentation
Compartment - Auxiliary Switches
Breaker Padlock Attachment on Circuit
Breaker
Push-to-Test Lights (Status Lights -
Open/Close)
Breaker ID Nameplate - Main
Strip Heaters in Breaker Compartment
Status Indicating Lights - Open/Close
Status Indicating Lights - Trip
Metering CTs
Cell - 7 BC

INCOMING 2 FEEDER BREAKERS & INSTRUMENTATION

1600A, MTZ2-16H1, Electrically Operated



**Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO**

**Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026**

Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Strip Heaters in Breaker Compartment
Cell - 5 D
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Push-to-Test Lights (Status Lights - Ready
to Close)
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Status Indicating Lights - Ready to Close
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 6 A
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle



**Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO**

**Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026**

Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Strip Heaters in Breaker Compartment
Cell - 6 B
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Spring Charging Motor (MCH) 120Vac
1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Strip Heaters in Breaker Compartment
Cell - 6 C
Load Side Power Direction - Cable (Bottom)

1600A, MTZ2-16H1, Electrically Operated
Feeder Breaker
DESCRIPTION:
Micrologic X Unit (6.0X), LSIG
Communications Module & Wiring - Feeder
Modbus RS485 Serial Communication to
Breaker/Cradle
Micrologic X Digital Module - ERMS
Sensor Plug Rating - 1600A
Trip Setting (Amps) - 1600
Plug for Remote Pendant Station
Energy Reduction Maintenance Switch -
Locally Mounted
Push-to-Test Lights (Status Lights - Fault
Status)
Breaker ID Nameplate - Feeder
4A Form C Contacts Auxiliary Switch
Shutters Over Bus in Cell
Shunt Close - Electrically Operated Feeder
Shunt Trip - Electrically Operated Feeder
Ready to Close Switch (PF)
Status Indicating Lights - Trip
Spring Charging Motor (MCH) 120Vac



Project Name: Detroit Diesel Substation
Replacement Ph
Primary Purchaser: MADISON ELECTRIC
CO

Order Number: 0051900946
Purchase Order Number: S000140084
Document Date: 04/24/2026

1C Connected, 1C Test, 1C Disconnected Cell
Switch Assembly
Breaker Padlock Attachment on Circuit
Breaker
Shunt Trip Coil (MX1) 120Vac
Closing Coil (XF) 120Vac
Push-to-Test Lights (Status Lights -
Open/Close)
Status Indicating Lights - Open/Close
Strip Heaters in Breaker Compartment
Cell - 6 D
Load Side Power Direction - Cable (Bottom)

LINEUP WATT LOSSES

Estimated Equipment Watts Loss (Fully Loaded)
for AC Calculation is 13023 Watts.
Note: For Watts Loss values on equipment with
breakers or sections loaded at less than
full load, consult product catalog for
derating watts loss or further analysis
options.

DETROIT DIESEL SUBST

FACTORY ORDER: 51900946-000010

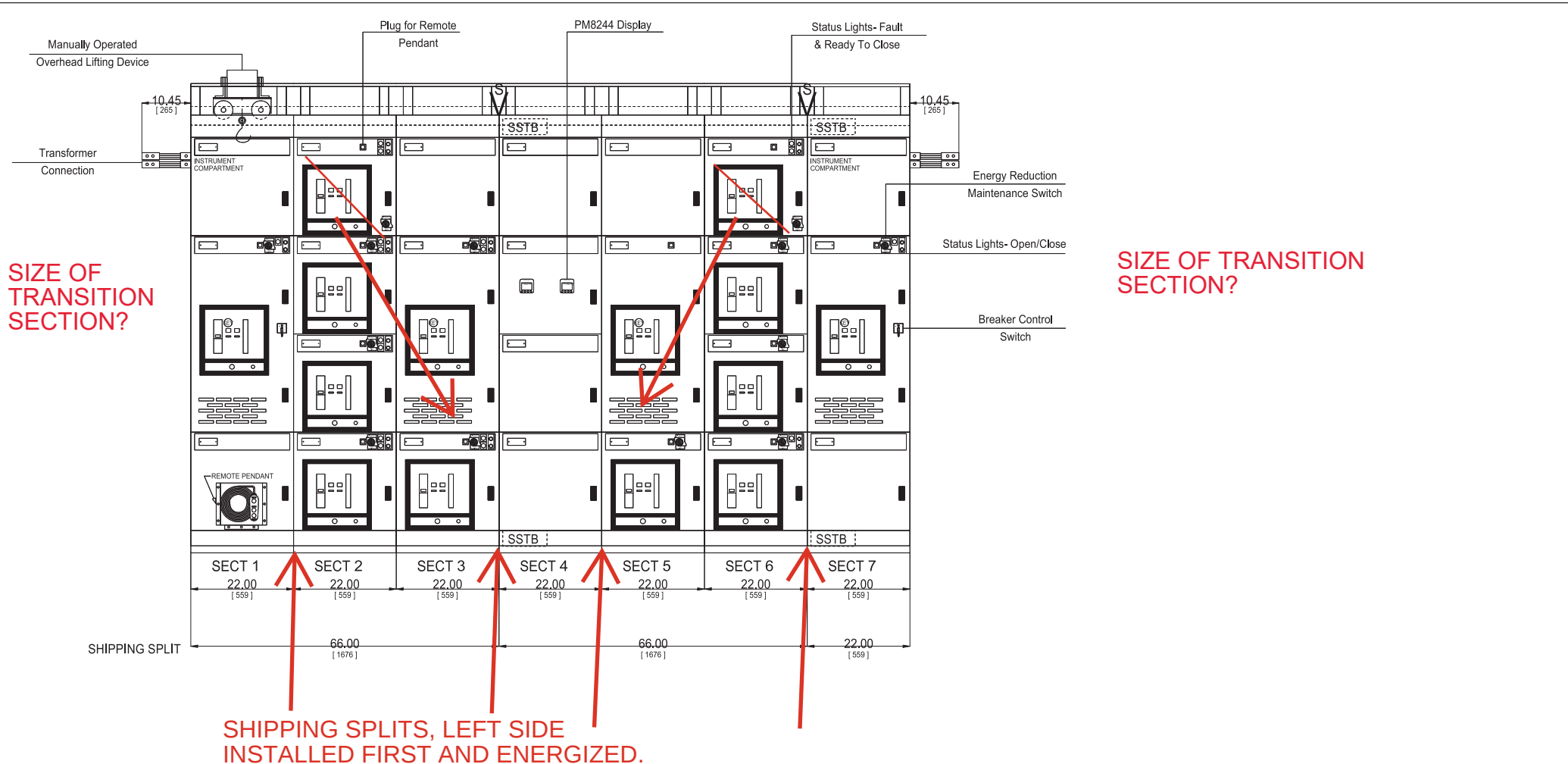
JOB LOCATION: REDFORD, MI

PURCHASER:
PURCHASER PO:
USER:
USER LOCATION:
CONSULTING ENG: 0

SALES CONTACT:
SALES LOCATION:
CUSTOMER: DETROIT DIESEL SUBSTATION PH1
CUSTOMER PO:
ARCHITECT:

Type text here

REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C	
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear	
					PROJECT ENGR: R. Salgado		
					DRAWN BY: RS		
					VERIFIED BY:	DRAWING: 51900946-000010 --01	
				PROJECT STATUS: APPROVAL	DATE: 2/3/2022	COVERSHEET	REV



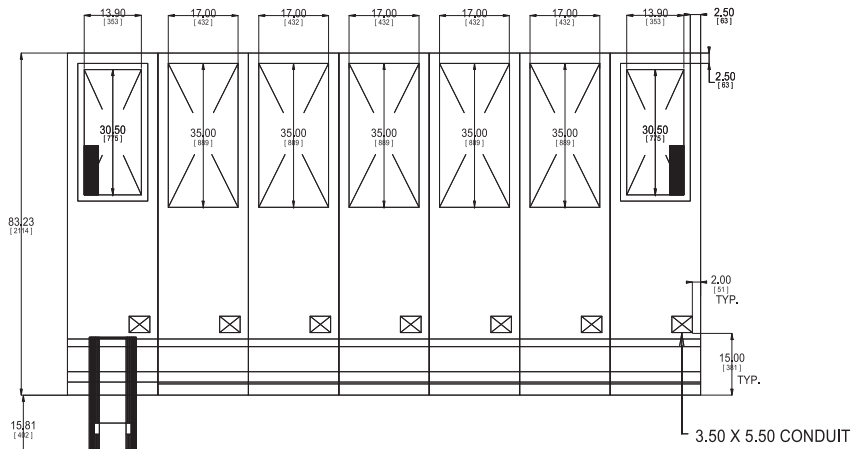
NOTE: Secondary 120ka/ph surge protection device will need to be added.
NOTE: PM8244 Power Meter will be changed to PM5563 Power Meter

 SHIPPING SPLIT
 SHIPPING SPLIT TERMINALS
NOTE: ALL MASTERPACT BREAKERS ARE TYPE MTZ

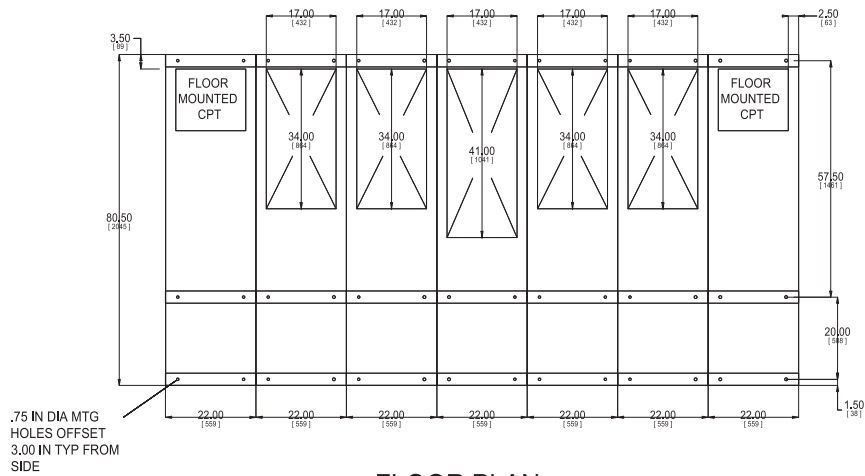
LINEUP WIDTH: 154.00 [3912] DUAL DIMENSIONS: INCHES [MILLIMETERS]

REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
					PROJECT ENGR: R. Salgado		DRAWING TYPE: ELEVATION	
					DRAWN BY: RS			
					VERIFIED BY:		DRAWING: F51900946-000010 -01-01	
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026	PG 01 OF 06 REV

XFMR
RESTRICTION
3.50 X 12.00
[89] [305]



TOP VIEW

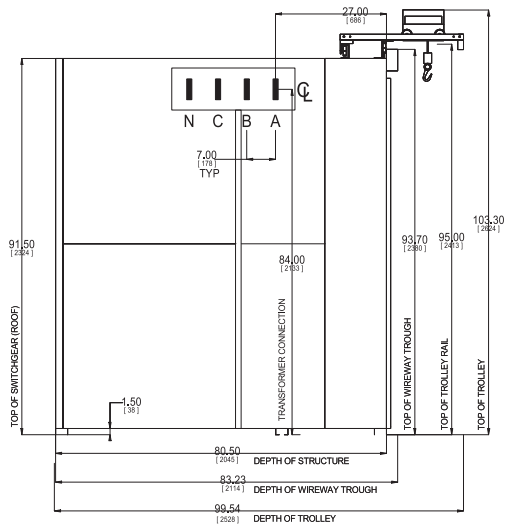


FLOOR PLAN

NOTE: ALL DEVICES REQUIRING DRILLING OR INSERTION IN MOUNTING PAD
SUCH AS CONDUIT, ANCHORING STUDS, SLEEVE INSERTS, ETC. SHOULD
BE INSTALLED BEFORE SETTING EQUIPMENT IN PLACE.

DUAL DIMENSIONS: INCHES
(MILLIMETERS)

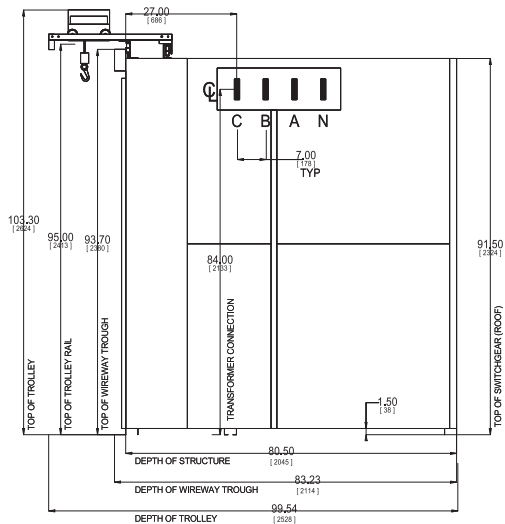
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C		
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear		
					PROJECT ENGR: R. Salgado		DRAWING TYPE: TOP VIEW/FLOOR PLAN		
					DRAWN BY: RS		DRAWING: F51900946-000010 -01-02		
					VERIFIED BY:				
						PROJECT STATUS: APPROVAL	DATE: 4/3/2026	PG 02 OF 06	REV



LEFT SIDE VIEW

UNIT SUBSTATION TRANSFORMER INFORMATION

TRANSFORMER TYPE:	Standard connection
KVA:	Standard connection
TEMP RISE: (DEG C)	Standard connection
% IMPEDANCE:	Standard connection
PRIMARY VOLTAGE:	Standard connection
SECONDARY VOLTAGE:	Standard connection
DRAWING NUMBER:	Standard connection



RIGHT SIDE VIEW

UNIT SUBSTATION TRANSFORMER INFORMATION

TRANSFORMER TYPE:	Standard connection
KVA:	Standard connection
TEMP RISE: (DEG C)	Standard connection
% IMPEDANCE:	Standard connection
PRIMARY VOLTAGE:	Standard connection
SECONDARY VOLTAGE:	Standard connection
DRAWING NUMBER:	Standard connection

DUAL DIMENSIONS: INCHES
(MILLIMETERS)

REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: SIDE VIEW
DRAWN BY: RS	
VERIFIED BY:	DRAWING: F51900946-000010 -01-03
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 03 OF 06 REV

GENERAL NOTES

Product Description & Rating

Power System Data
480Y/277V 3Ph 4W 60 Hz.
Solidly Grounded Neutral
Neutral 100 Percent Of Main Bus Rating
Maximum Available Fault Current (RMS): 65kA
Incoming Section Bay 1 Liquid Transformer
Incoming Section Bay 7 Liquid Transformer
Control Power: 15kVA-120V Secondary
Modified Differential Ground Fault System

Bus System Data
3200A Copper Bus, Silver Plated, Thermal Rated
Bus Bracing (RMS): 85kA

Enclosure Data
Enclosure Type: Indoor Type 1
Exterior Paint Color: ANSI 49
Gasketing (Doors & Sections)
Rodent Proof with Bottom Plate

~~Drip Hoods~~
Hinged Cable Compartment Doors, Padlock Provision, Standard Latches
Interbay Barriers, Cable Compartment
Interbay Barriers, Bus Compartment
Bus Isolation Barriers for Main Breaker(s)
3 Inch Infrared Viewing Windows for Customer Load Connections
Space Heaters- NW Breaker Compartments
Space Heaters- Bus Compartments
Space Heaters- Cable Compartments
Thermostat for Space Heaters
Humidistat for Space Heaters
Plastic Mimic Bus— Black on Grey

Estimated Shipping Weight
Ship Split 1 6352.00 LBS / 2881.22 KGS
Ship Split 2 6001.00 LBS / 2722.01 KGS
Ship Split 3 1751.00 LBS / 794.24 KGS
NOTE: Refer to the shipping documents for actual weights of the equipment.

Codes & Standards
Equipment built to ANSI - UL1558 Code Standards
Incoming Section Bay 1 is Suitable for use as Service Entrance when not more than 6 disconnects are provided
Incoming Section Bay 7 is Suitable for use as Service Entrance when not more than 6 disconnects are provided

Product Information

Wiring
Wires shall be labeled with destination marking (destination-origin)
NOTE: When connecting cables, use 90 degree Celsius insulated conductors based on the ampacity of 75 degree Celsius conductors unless otherwise indicated by supplemental instructions.

Cable Terminations
Cable Terminations in this equipment are to be per 2020 NEC table 310.16 in accordance with 2020 NEC 110.14(C)(1) or equivalent applicable local standards.

Instruction Bulletins
Refer to 80298-002-08 Instruction Bulletin for PZ4 installation
Refer to 80298-003-01 Instruction Bulletin for Drip/Sprinkler Resistant installation

Shipping Instructions
Install 3 Pole Breakers For Shipment. Ship 6 Pole Breakers Separately.
(Continued on next page.)

SYMBOL LEGEND

	SURGE ARRESTOR
	POWER METER OR CIRCUIT MONITOR
	SURGE PROTECTIVE DEVICE
	LUG CONNECTION WITH CT
	LUG CONNECTION WITHOUT CT
	NEUTRAL DISCONNECT LINK
	CIRCUIT BREAKER
	PREPARED CELL

REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
					PROJECT ENGR: R. Salgado		DRAWING TYPE: GENERAL NOTES	
					DRAWN BY: RS			
					VERIFIED BY:		DRAWING: F51900946-000010 -01-04	
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026	
								PG 04 OF 06 REV

GENERAL NOTES CONTINUED

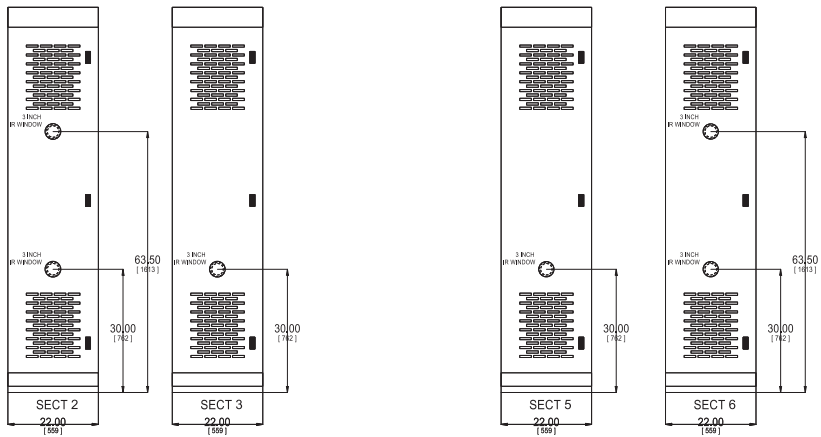
QR Code Commercial Reference
Power-Zone 4 (LVESWGN_PZ4)

Product Accessories

- Modbus RS485 to Ethernet TCP - Communications Wired to Ethernet Gateway, Copper
- Shutters Over Bus in Cells
- Section Bay 1 PM8244 Power Meter
- Section Bay 7 PM8244 Power Meter
- Energy Reduction Maintenance Setting (ERMS) Switch(s) Included in Lineup
- Overhead Breaker Lifter with Rails
- Lineup Equipped with Remote Control Pendant Station and Mounting Bracket
- Breaker Cell(s) Equipped With Socket to Accept Connection of Remote Control Pendant Station
- Pilot Lights Equipped with Push-to-Test Feature
- Spare Fuses (1 Set)
- Certified Test Report
- Extra Breaker Grease - 1 Tube

NOTE: Secondary 120ka/ph surge protection device will need to be added.
NOTE: PM8244 Power Meter will be changed to PM5563 Power Meter

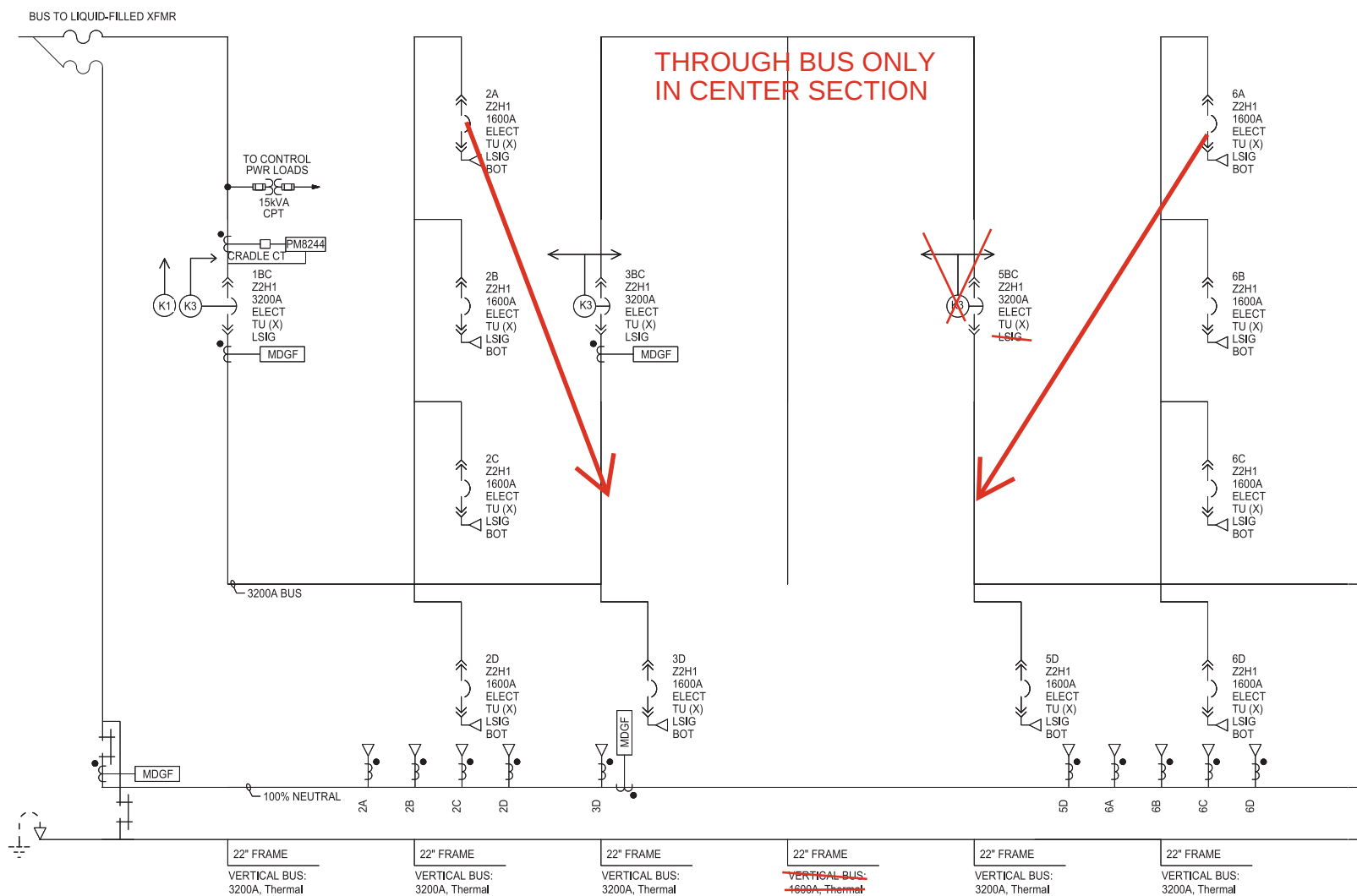
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
					PROJECT ENGR: R. Salgado	DRAWING TYPE: GENERAL NOTES
					DRAWN BY: RS	
					VERIFIED BY:	DRAWING: F51900946-000010 -01-05
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026
					PG 05 OF 06	REV



REAR VIEW

DUAL DIMENSIONS: INCHES (MILLIMETERS)

REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
					PROJECT ENGR: R. Salgado	DRAWING TYPE: IR WINDOW LOCATION DETAILS
					DRAWN BY: RS	
					VERIFIED BY:	DRAWING: F51900946-000010 -01-06
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026
					PG 06 OF 06 REV	



NOTE: Secondary 120ka/ph surge protection device will need to be added.

NOTE: PM8244 Power Meter will be changed to PM5563 Power Meter

NOTE: ALL MASTERPACT BREAKERS ARE TYPE MTZ

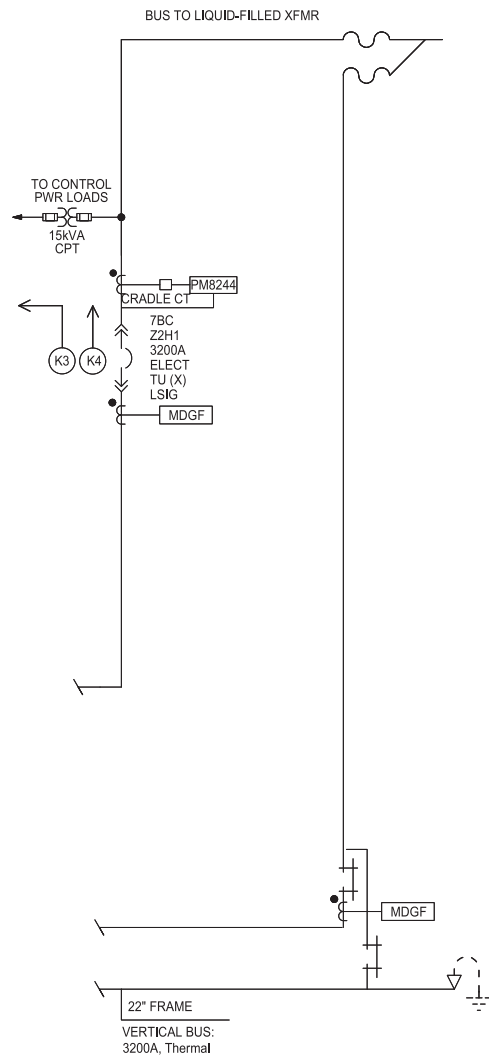
TOP, BOT - INDICATES CABLE CONDUIT LOCATION

REV	DESCRIPTION	BY	DATE



by Schneider Electric

JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: ONE LINE
DRAWN BY: RS	DRAWING: Q51900946-000010 -01-01
VERIFIED BY:	PG 01 OF 03 REV
PROJECT STATUS: APPROVAL	DATE: 4/3/2026



NOTE: Secondary 120ka/ph surge protection device will need to be added.
NOTE: PM8244 Power Meter will be changed to PM5563 Power Meter
NOTE: ALL MASTERPACT BREAKERS ARE TYPE MTZ

TOP, BOT - INDICATES CABLE CONDUIT LOCATION

REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: ONE LINE
DRAWN BY: RS	DRAWING: O51900946-000010 -01-02
VERIFIED BY:	PG 02 OF 03
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	REV

POWER-ZONE 4 SWITCHGEAR - CIRCUIT BREAKER TABLE - MASTERPACT MTZ																		
CELL NO	BREAKER DESIGNATION	1	BKR TYPE	BKR OPER	BREAKER TRIP UNIT	FRAME SIZE	SENSOR PLUG	TRIP SETTING	RATING PLUG	BKR AIC	TRIP PARAM	2 LUGS PER PHASE: MECHANICAL					BREAKER AND CRADLE ACCESSORIES (NON STANDARD)	
												QTY	A,B,C ϕ SIZE	QTY	NEUT SIZE	QTY		GND SIZE
1BC	MB-1 M1C-1 MAIN		Z2H1	ELECT	6.0X	3200A	3200A	3200A	-	65kA	LSIG	-	Transformer-In	-	-	1	3/0 - 750kcmil	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,MCT,K,PL,SH,PBL,D9
2A			Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
2B	FEEDER M1C-2B		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
2C	FEEDER M1C-2C		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
2D	FEEDER M1C-2D		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
3BC	Tie breaker M1C-TIE		Z2H1	ELECT	6.0X	3200A	3200A	3200A	-	65kA	LSIG	-	Tie 1	-	-	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,K,PF,PL,SH,PBL,D9
3D	FEEDER M1C-3D		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
5BC	2nd Tie breaker M1C TIE ISOLATION SWITCH		Z2H1	ELECT	6.0X	3200A	3200A	3200A	-	65kA	LSIG	-	Tie 2	-	-	-	-	CE1,CT1,CD1,MCH,MX1,XF,COM,XPF,PL,SH
5D	FEEDER M1C-5D		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PL,SH,D9
6A			Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
6B	FEEDER M1C-6B		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PL,SH,D9
6C	FEEDER M1C-6C		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PL,SH,D9
6D	FEEDER M1C-6D		Z2H1	ELECT	6.0X	1600A	1600A	1600A	-	65kA	LSIG	0	--	0	--	-	-	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,PF,PL,SH,D9
7BC	MB-2 M1C-2 MAIN		Z2H1	ELECT	6.0X	3200A	3200A	3200A	-	65kA	LSIG	-	Transformer-In	-	-	1	3/0 - 750kcmil	CE1,CT1,CD1,MCH,MX1,XF,ESM,COM,MCT,K,PL,SH,PBL,D9

LEGEND

	STANDARD ACCESSORIES FOR MTZ
OF4	AUXILIARY CONTACTS - TYPE MTZ (STD)
UC1	ZSI SECONDARIES (STD)
UC2	MODIFIED DIFFERENTIAL GROUND FAULT (STD)
UC3	24VDC POWER SUPPLY (STD)
SDE1	ELECTRICAL FAULT ALARM CONTACT (STD)
CPL	CRADLE PADLOCK ATTACHMENT (STD)
	NON-STANDARD ACCESSORIES FOR MTZ
CE(X)	CONNECTED CELL SWITCHES (X=QTY)
CT(X)	TEST CELL SWITCHES (X=QTY)
CD(X)	DISCONNECTED CELL SWITCHES (X=QTY)
COM	COMMUNICATIONS or ERMS
M2C	PROGRAMMABLE CONTACT MODULE (2 CONTACTS)
SDE2	ADDITIONAL ELECTRICAL FAULT ALARM CONTACT
RES	ELECTRICAL RESET
MN	UNDERVOLTAGE TRIP COIL
MX1	SHUNT TRIP COIL
MX2	SECOND SHUNT TRIP COIL
4P	4 POLE BREAKER

XF	SHUNT CLOSE COIL
MCH	SPRING CHARGING MOTOR
MX1C	SHUNT TRIP COIL WITH COMMS
XFC	SHUNT CLOSE COIL WITH COMMS
PF	READY TO CLOSE CONTACT
OF(X)	AUXILIARY CONTACTS (X=QTY)
EF(X)	CONNECTED AND CLOSED CONTACTS (X=QTY)
SH(X)	SHUTTERS (P=POSITION, L=LOCK PROVISION)
MCT	METERING CTS
PBL	PUSHBUTTON INTERLOCK COVER
AR	AUTOMATIC RESET
CDM	OPERATIONS COUNTER
PL	PADLOCK ATTACHMENT (REQD FOR KEYLOCK)
K	KEY INTERLOCK
CK	CRADLE KEY INTERLOCK
UC4	EXTERNAL VOLTAGE INPUTS
ESM	ERMS SWITCH MODULE
WL	MTZ BLUETOOTH AND ZIGBEE REMOVED

MICROLOGIC (X) DIGITAL MODULES

D1	HARMONIC METER
D2	ENERGY PER PHASE
D3	OPERATION ASSISTANT
D4	RESTORATION ASSISTANT
D5	WAVEFORM CAPTURE
D6	ANSI 27/59 UNDERVOLTAGE/OVERVOLTAGE
D7	ANSI 32P REVERSE POWER
D8	GROUND FAULT ALARM
D9	ENERGY REDUCTION MAINTENANCE SETTINGS
D10	MODBUS LEGACY DATASET
D11	ANSI 81 FREQUENCY PROTECTION
D12	ANSI 67 DIRECTIONAL OVERCURRENT PROTECTION
D13	ANSI 51 IDMTL OVERCURRENT PROTECTION
D14	IEC 61880 FOR MASTERPACT MTZ

NOTES

↗

ENGRAVED NAMEPLATES SHALL BE WHITE BACKGROUND WITH BLACK LETTERS.

↗

LUG QUANTITIES ARE BASED ON COPPER CABLES.

REV	DESCRIPTION	BY	DATE

SQUARE D

by Schneider Electric

JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
PROJECT ENGR: R. Salgado		DRAWING TYPE: DEVICE TABLE	
DRAWN BY: RS			
VERIFIED BY:		DRAWING: Q51900946-000010 -01-03	
PROJECT STATUS: APPROVAL	DATE: 4/3/2026	PG 03 OF 03	REV

PURPOSE: TO PREVENT PARALLELING OF SOURCES - ALL FOUR BREAKERS CLOSED AT THE SAME TIME, TO PERMIT LOAD 1 AND LOAD 2 TO BE FED BY SEPARATE SOURCES OR HAVE BOTH LOADS FED BY THE SAME SOURCE, TO PREVENT OPERATION OF HV SWITCH 1 WHEN BREAKER A IS CLOSED, TO PREVENT OPERATION OF HV SWITCH 2 WHEN BREAKER B IS CLOSED.

NORMAL OPERATING CONDITION: SOURCE 1 FEEDING LOAD 1, SOURCE 2 FEEDING LOAD 2, BREAKERS A AND B CLOSED, TIE BREAKERS OPEN, HV SWITCHES 1 AND 2 CLOSED,

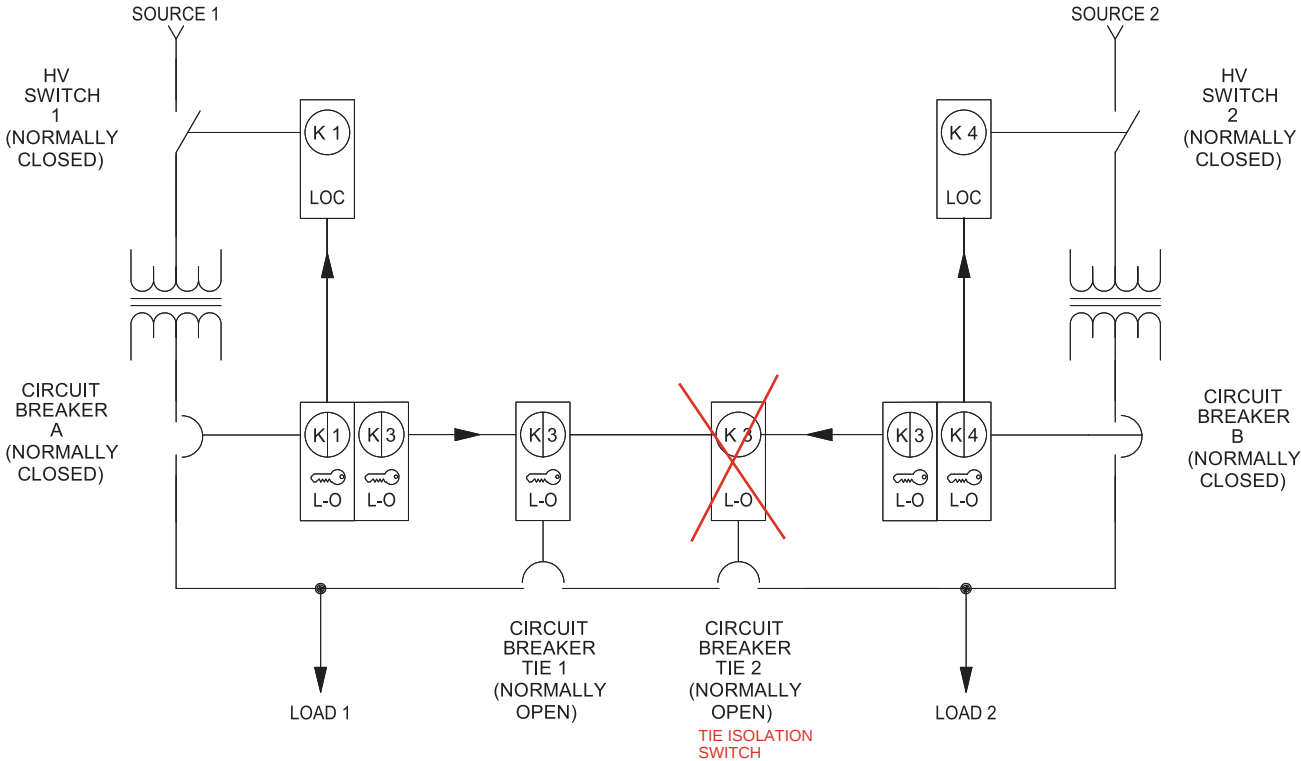
KEY TRANSFER SEQUENCE -1
DESIRED CONDITION: SOURCE 1 FEEDING BOTH LOADS 1 & 2 - BREAKERS A AND TIES CLOSED, BREAKER B OPEN.
1. OPEN BREAKER B AND ROTATE KEY K 3 TO LOCK BREAKER OPEN - KEY IS NOW FREE.
2. REMOVE KEY K 3 FROM BREAKER B AND INSERT KEY INTO LOCK ON TIE BREAKER.
3. ROTATE KEY K 3 TO UNLOCK TIE BREAKERS - KEY IS NOW HELD CAPTIVE.
4. CLOSE TIE BREAKERS.
5. REVERSE PROCEDURE TO RESTORE LOAD 2 TO SOURCE 2.

KEY TRANSFER SEQUENCE -2
DESIRED CONDITION: SOURCE 2 FEEDING BOTH LOADS 1 & 2 - BREAKERS B AND TIES CLOSED, BREAKER A OPEN.
1. OPEN BREAKER A AND ROTATE KEY K 3 TO LOCK BREAKER OPEN - KEY IS NOW FREE.
2. REMOVE KEY K 3 FROM BREAKER A AND INSERT KEY INTO LOCK ON TIE BREAKER.
3. ROTATE KEY K 3 TO UNLOCK TIE BREAKERS - KEY IS NOW HELD CAPTIVE.
4. CLOSE TIE BREAKERS.
5. REVERSE PROCEDURE TO RESTORE LOAD 1 TO SOURCE 1.

TO OPERATE HV SWITCH 1:
1. OPEN BREAKER A, IF CLOSED, AND ROTATE KEY K1 TO LOCK BREAKER OPEN - KEY IS NOW FREE.
2. REMOVE KEY K1 FROM BREAKER A AND INSERT KEY INTO LOCK ON HV SWITCH 1.
3. ROTATE KEY K1 TO UNLOCK HV SWITCH 1 - KEY IS NOW HELD CAPTIVE.
4. OPEN OR CLOSE HV SWITCH 1.
5. REVERSE PROCEDURE TO CLOSE BREAKER A.

TO OPERATE HV SWITCH 2:
1. OPEN BREAKER B, IF CLOSED, AND ROTATE KEY K4 TO LOCK BREAKER OPEN - KEY IS NOW FREE.
2. REMOVE KEY K4 FROM BREAKER B AND INSERT KEY INTO LOCK ON HV SWITCH 2.
3. ROTATE KEY K4 TO UNLOCK HV SWITCH 2 - KEY IS NOW HELD CAPTIVE.
4. OPEN OR CLOSE HV SWITCH 2.
5. REVERSE PROCEDURE TO CLOSE BREAKER B.

NOTE:
1. THIS SYSTEM USES THREE (3) K3 KEYS ONLY. ANY SPARE KEYS MUST BE REMOVED AND SECURED TO PREVENT UNAUTHORIZED ACCESS.
2. THIS SYSTEM USES ONE (1) K1 AND (1) K4 KEY ONLY. ANY SPARE KEYS MUST BE REMOVED AND SECURED TO PREVENT UNAUTHORIZED ACCESS.

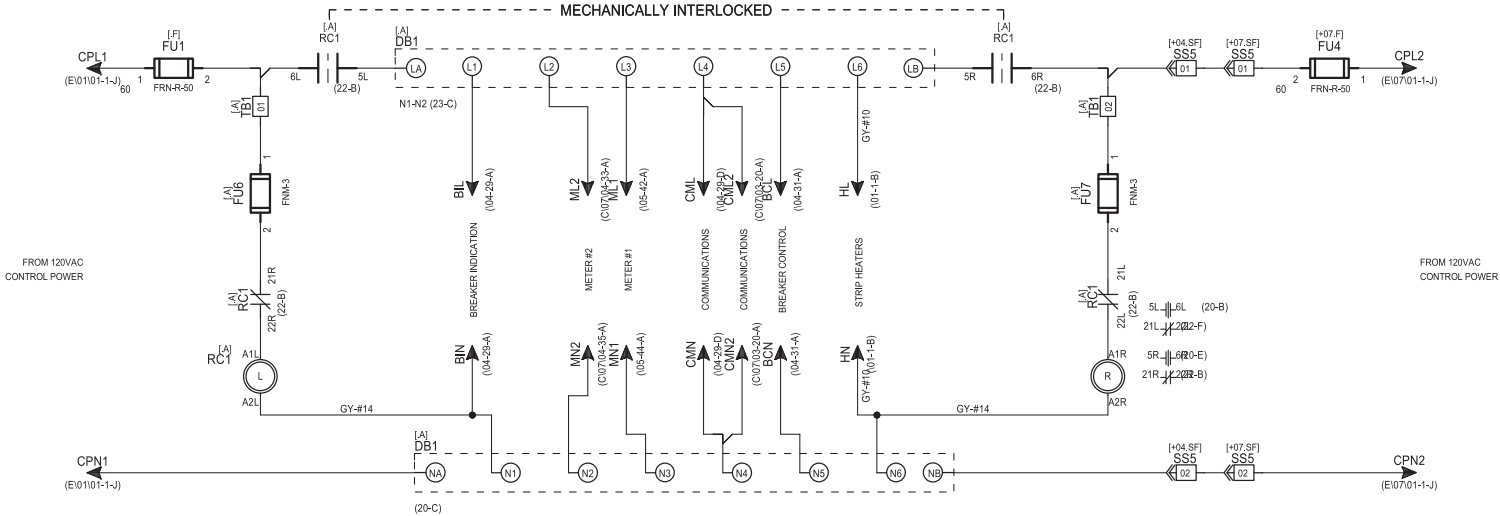


REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: KEY INTERLOCK SCHEME
DRAWN BY: RS	DRAWING: K51900946-000010 -01-01
VERIFIED BY:	PG 01 OF 01 REV
PROJECT STATUS: APPROVAL	DATE: 4/3/2026

CONTROL POWER DISTRIBUTION



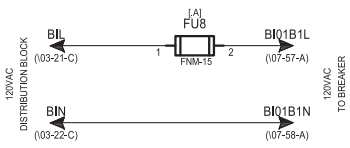
REV	DESCRIPTION	BY	DATE



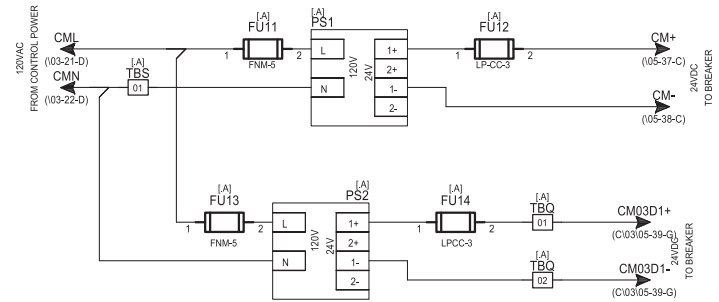
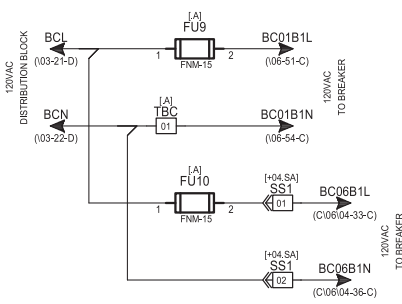
JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL A INSTRUMENT COMPARTMENT
DRAWN BY: RS	DRAWING: C51900946-000010 -01-03
VERIFIED BY:	SECTION +01
PROJECT STATUS: APPROVAL	PG 03 OF 08
DATE: 4/3/2026	REV

COMMUNICATIONS POWER SUPPLY

BKR INDICATION FUSE



BKR CONTROL FUSE

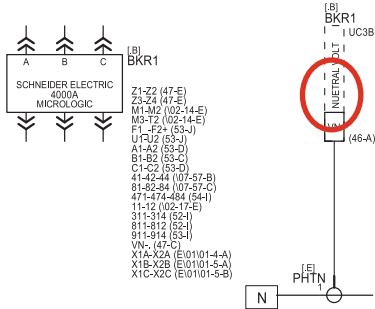


REV	DESCRIPTION	BY	DATE

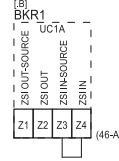


JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL A INSTRUMENT COMPARTMENT
DRAWN BY: RS	DRAWING: C51900946-000010 -01-04
VERIFIED BY:	SECTION +01
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
PG 04 OF 08	REV

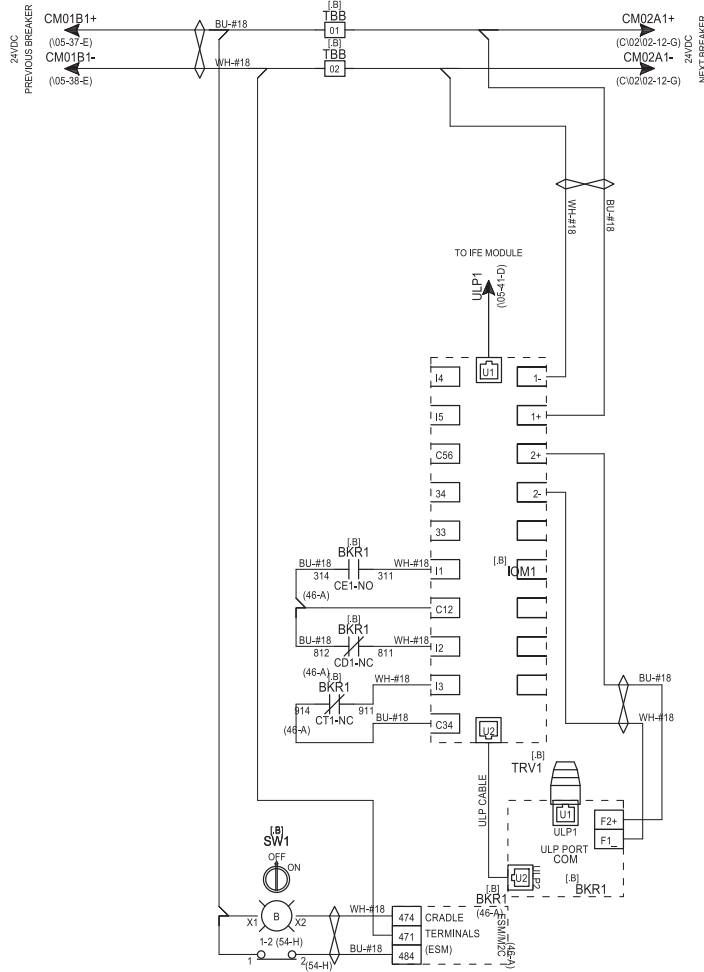
MASTER BREAKER SYMBOL



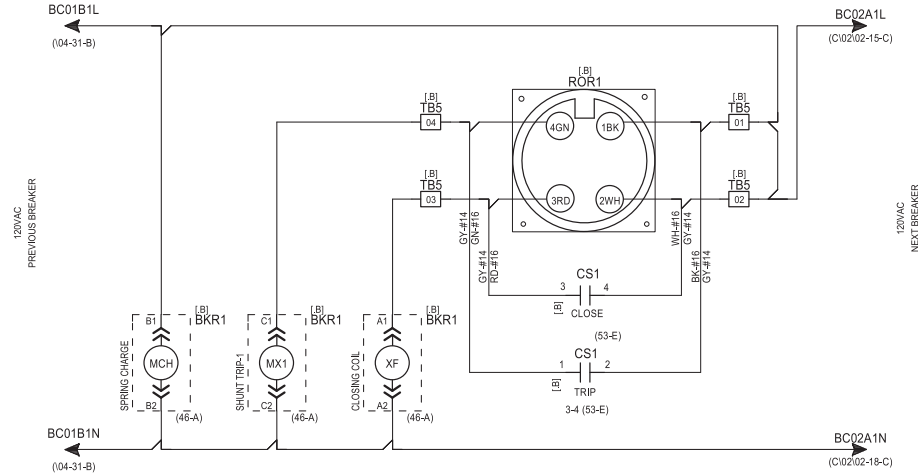
FACTORY JUMPERS



COMMUNICATIONS



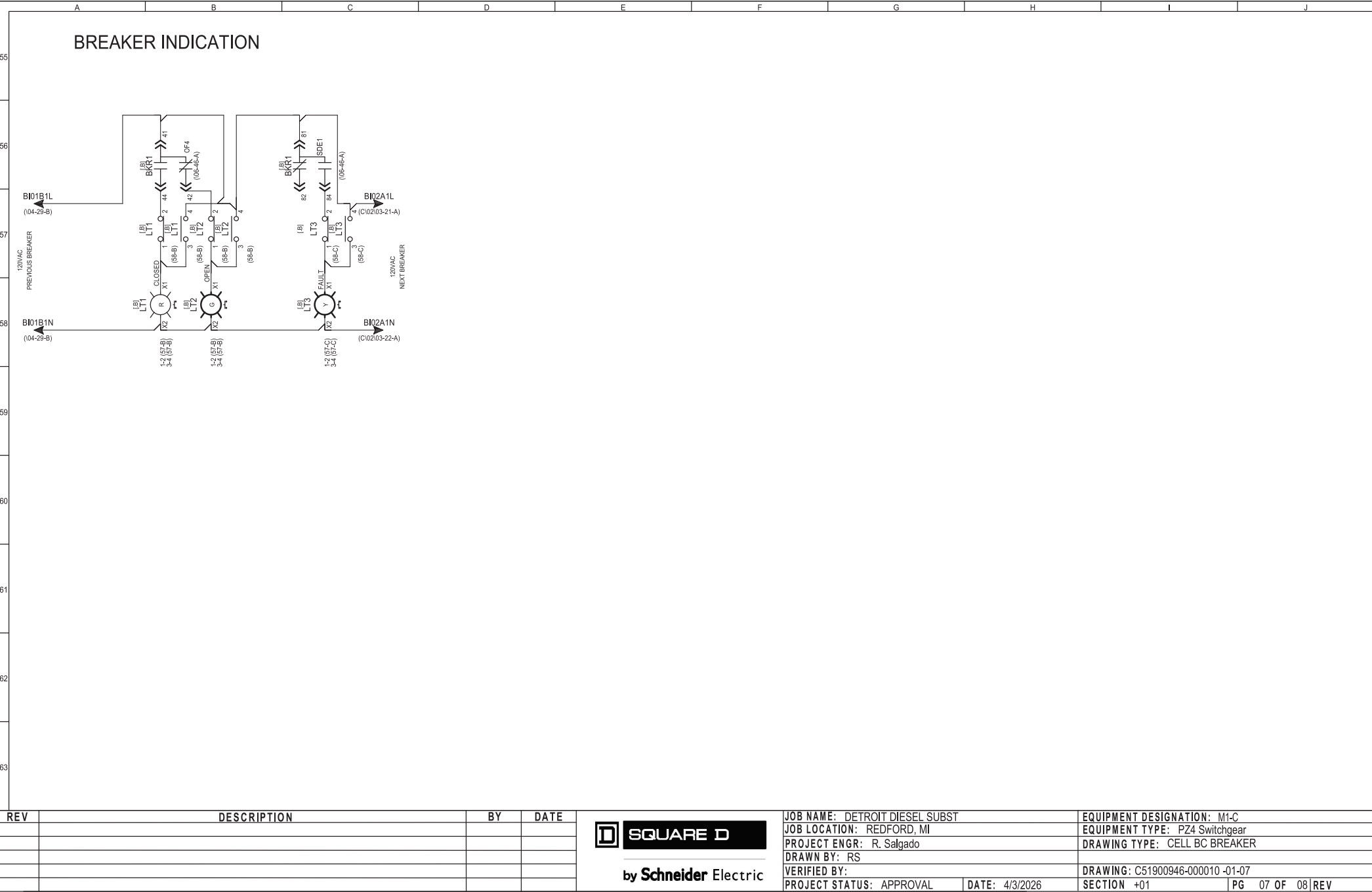
BREAKER CONTROL

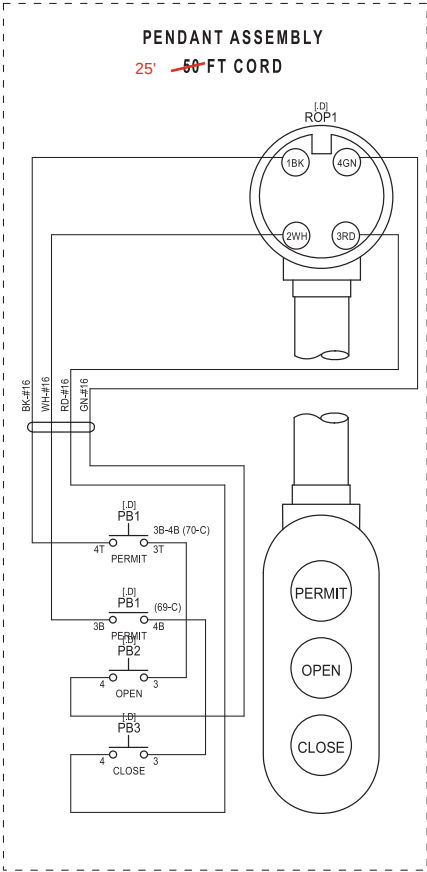


REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -01-06
VERIFIED BY:	SECTION +01
PROJECT STATUS: APPROVAL	PG 06 OF 08 REV





OE NOTE:
IF CELL 1D IS UNAVAILABLE, MOVE REMOTE PENDANT STATION
TO AN AVAILABLE COMPARTMENT DOOR.

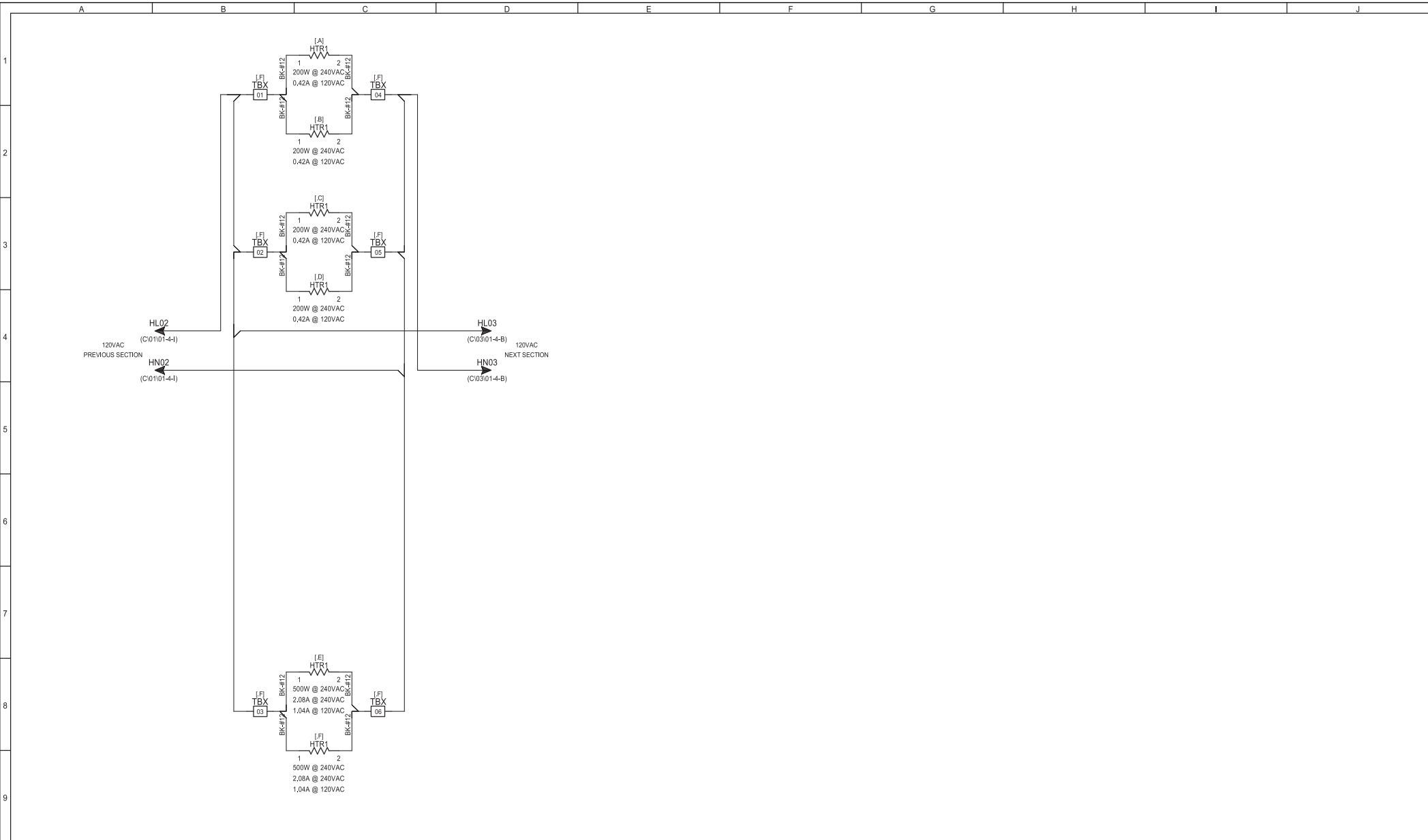
REMOTE PENDANT STATION

REV	DESCRIPTION	BY	DATE

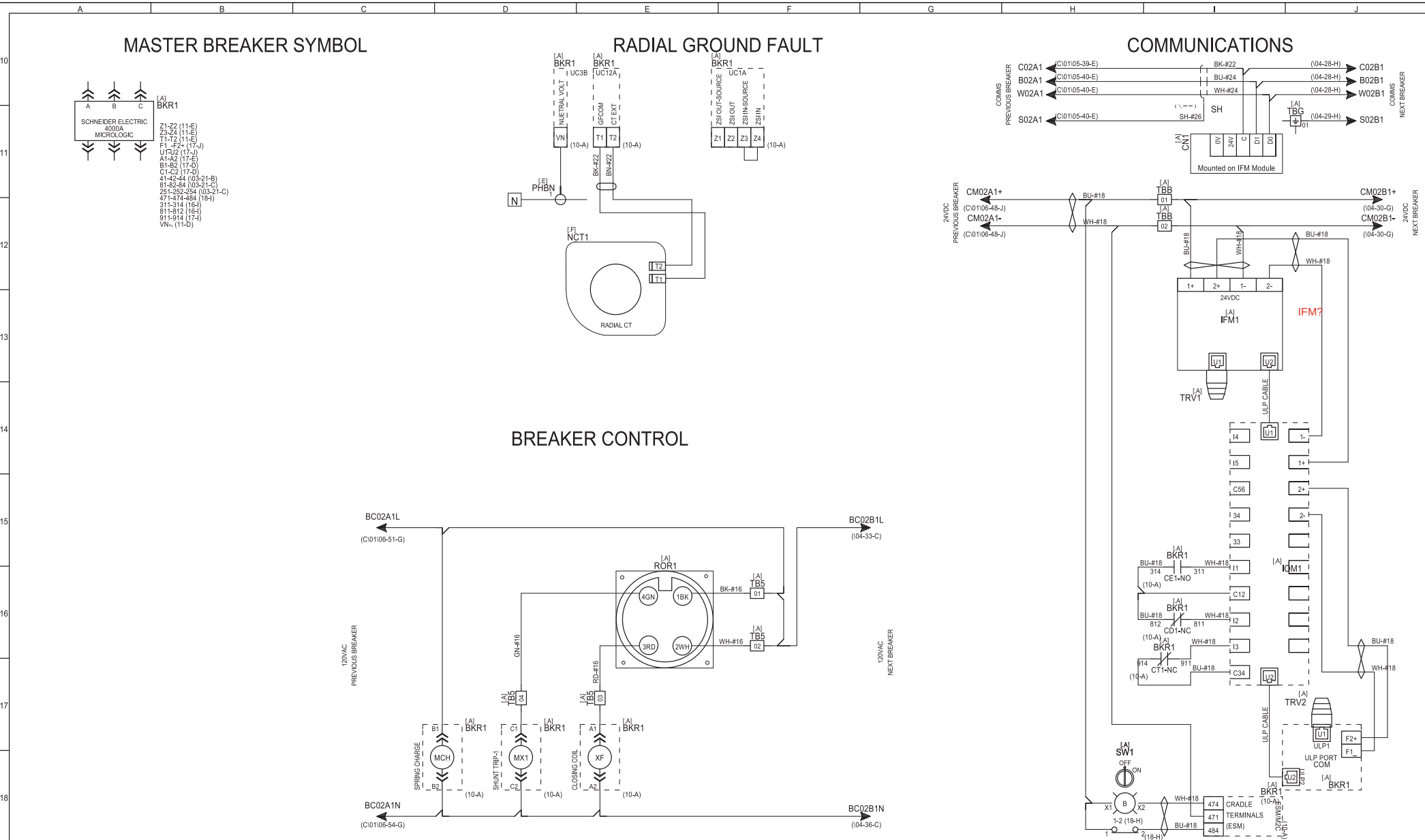
 **SQUARE D**

by **Schneider Electric**

JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL D REMOTE PENDANT STATION	
DRAWN BY: RS		DRAWING: C51900946-000010 -01-08	
VERIFIED BY:		SECTION +01	
PROJECT STATUS: APPROVAL		DATE: 4/3/2026	PG 08 OF 08 REV



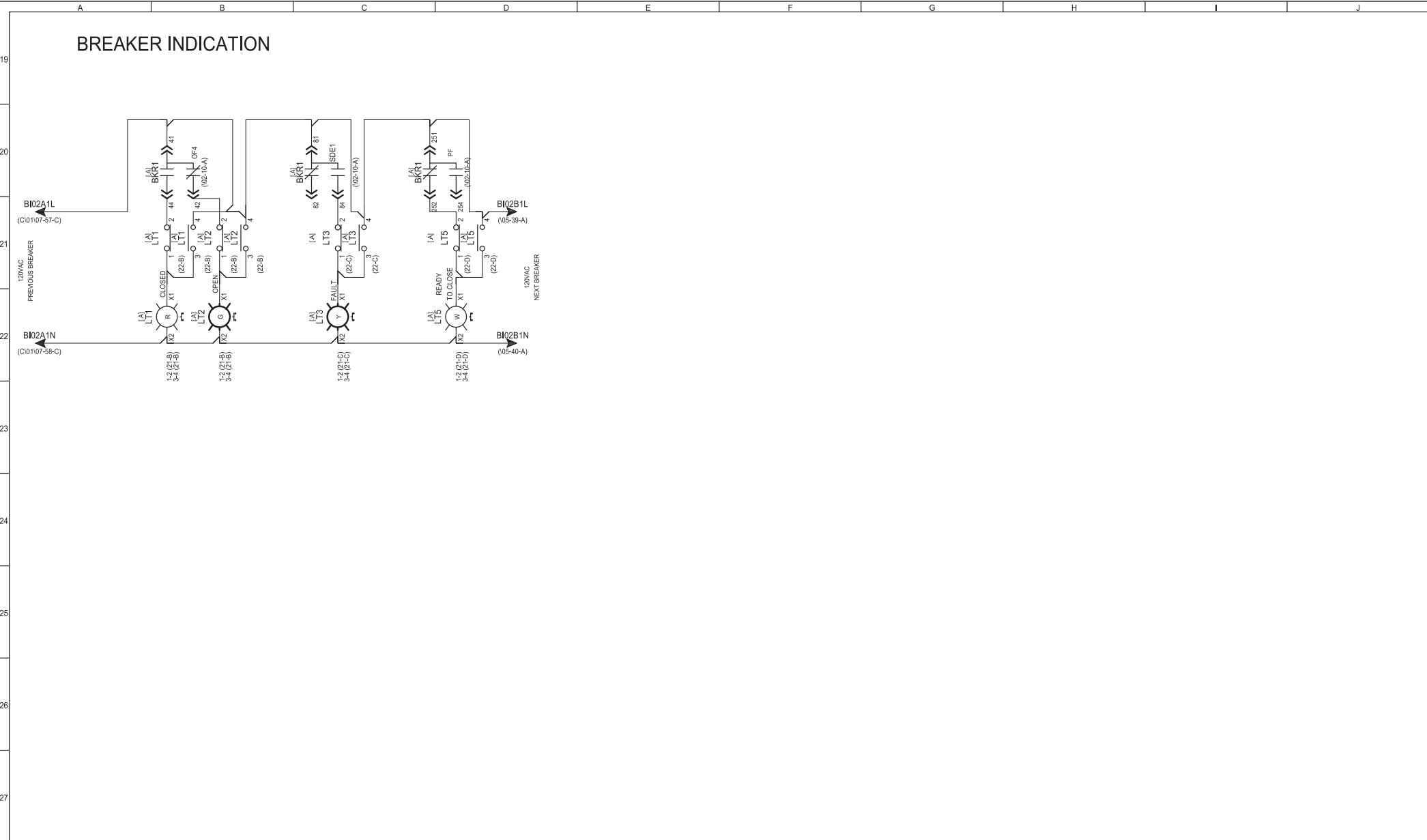
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C			
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear			
					PROJECT ENGR: R. Salgado		DRAWING TYPE: STRIP HEATERS			
					DRAWN BY: RS		DRAWING: C51900946-000010 -02-01			
					VERIFIED BY:		SECTION +02			
				PROJECT STATUS: APPROVAL		DATE: 4/3/2026		PG 01 OF 09		REV



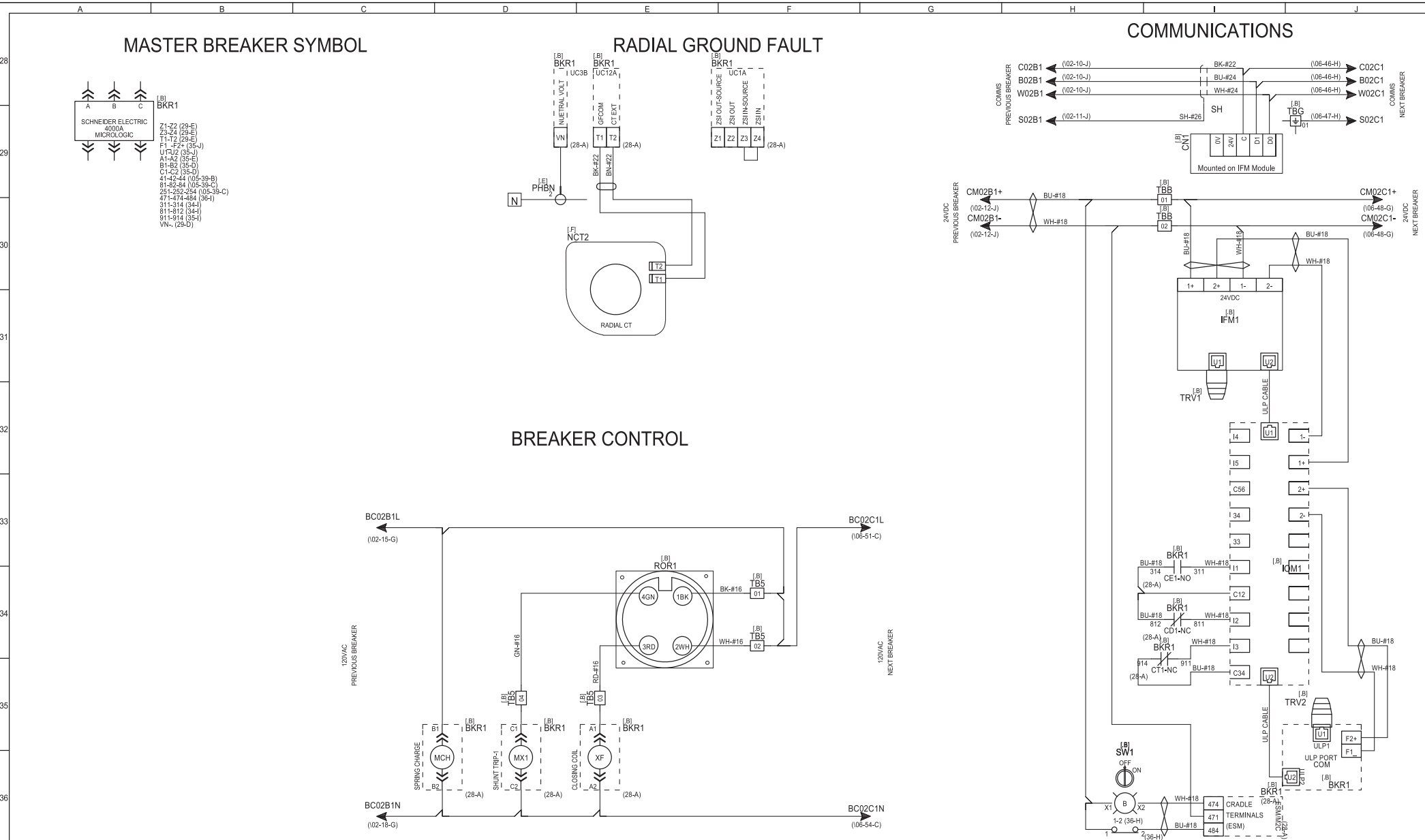
REV	DESCRIPTION	BY	DATE			JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
						JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
						PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL A BREAKER
						DRAWN BY: RS	
						VERIFIED BY:	DRAWING: C51900946-000010 -02-02
						PROJECT STATUS: APPROVAL	SECTION +02
						DATE: 4/3/2026	PG 02 OF 09 REV



by Schneider Electric



REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
						JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
						PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL A BREAKER	
						DRAWN BY: RS		DRAWING: C51900946-000010 -02-03	
						VERIFIED BY:		SECTION +02	
						PROJECT STATUS: APPROVAL		PG 03 OF 09 REV	
				DATE: 4/3/2026					



REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL B BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -02-04
VERIFIED BY:	SECTION +02
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 04 OF 09 REV

Diagram illustrating the Breaker Indication circuit, showing the connection between the 120VAC power source and the breaker status indicators (BI02B1L, BI02B1N, BI02C1L, BI02C1N) through various relays and switches.

The circuit is divided into two main sections: the Previous Breaker (left) and the Next Breaker (right).

Previous Breaker Section:

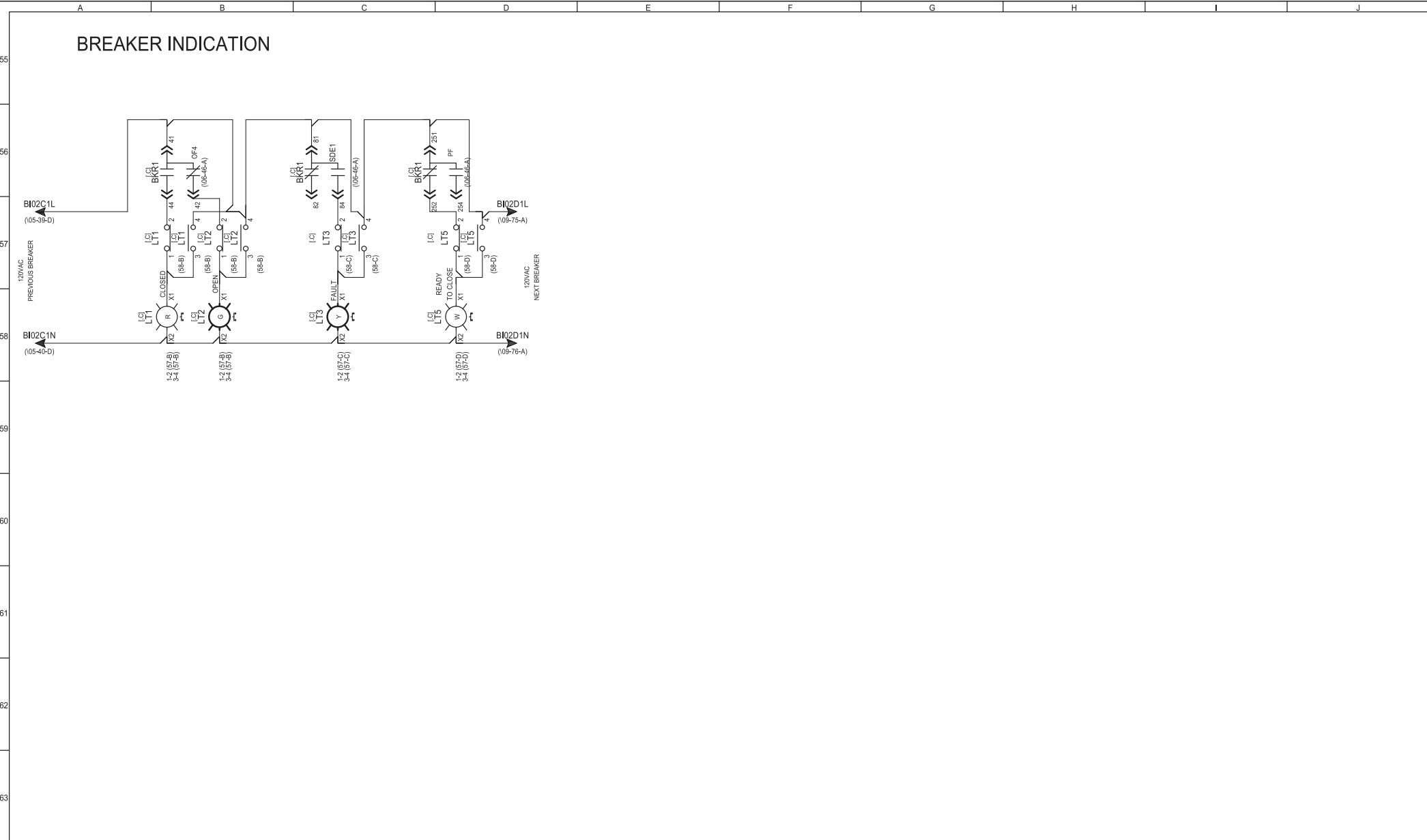
- BI02B1L (003-21-D):** Connected to the 120VAC source through a series of relays (L11, L12, L13) and switches (X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38, X39, X40, X41, X42, X43, X44, X45, X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, X56, X57, X58, X59, X60, X61, X62, X63, X64, X65, X66, X67, X68, X69, X70, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X86, X87, X88, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, X100).
- BI02B1N (003-22-D):** Connected to the 120VAC source through a series of relays (L11, L12, L13) and switches (X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38, X39, X40, X41, X42, X43, X44, X45, X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, X56, X57, X58, X59, X60, X61, X62, X63, X64, X65, X66, X67, X68, X69, X70, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X86, X87, X88, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, X100).

Next Breaker Section:

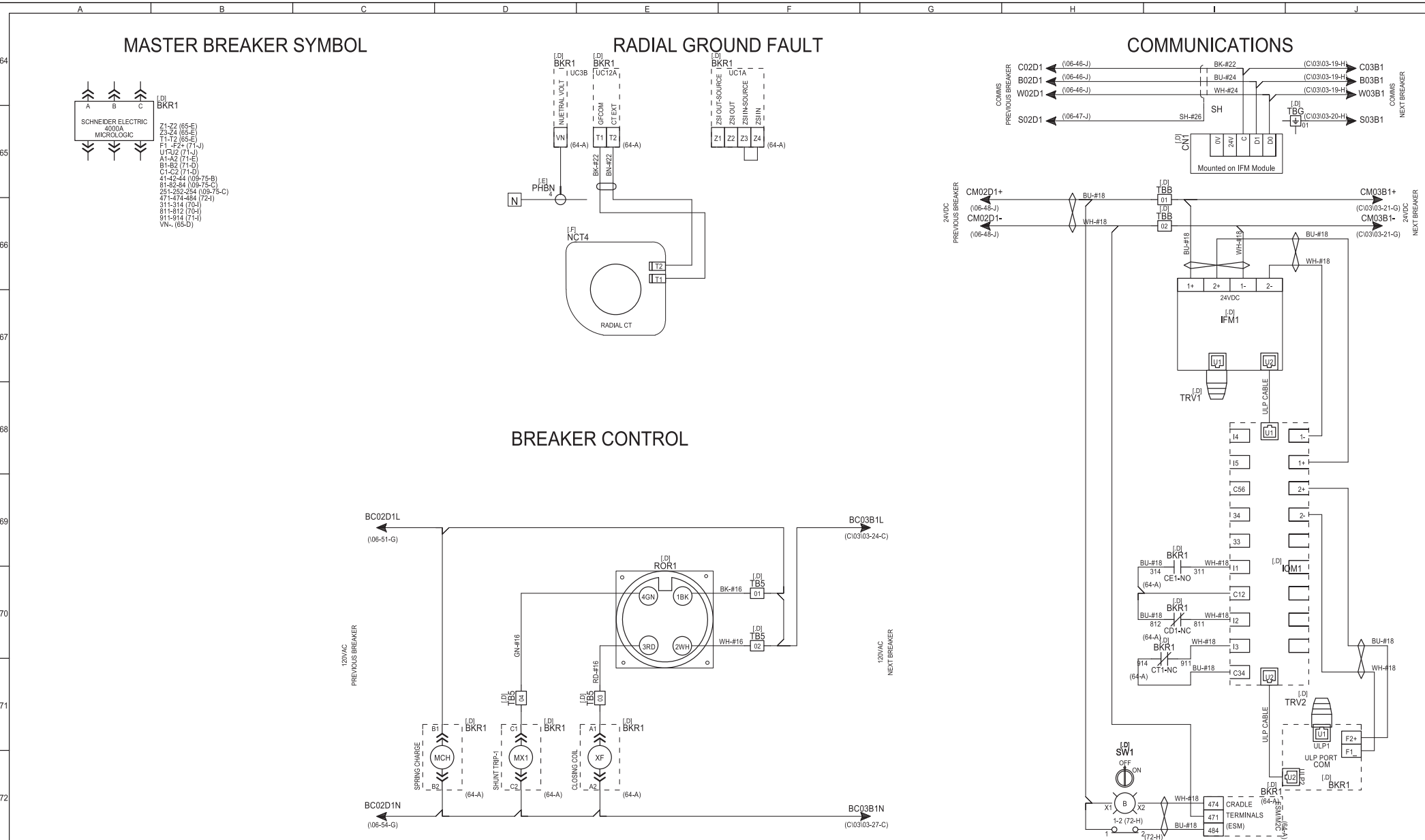
- BI02C1L (007-57-A):** Connected to the 120VAC source through a series of relays (L11, L12, L13) and switches (X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38, X39, X40, X41, X42, X43, X44, X45, X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, X56, X57, X58, X59, X60, X61, X62, X63, X64, X65, X66, X67, X68, X69, X70, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X86, X87, X88, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, X100).
- BI02C1N (007-58-A):** Connected to the 120VAC source through a series of relays (L11, L12, L13) and switches (X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38, X39, X40, X41, X42, X43, X44, X45, X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, X56, X57, X58, X59, X60, X61, X62, X63, X64, X65, X66, X67, X68, X69, X70, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X86, X87, X88, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, X100).

The diagram shows the internal wiring and components of the breaker indication system, including the 120VAC power source, the relays (L11, L12, L13), and the switches (X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38, X39, X40, X41, X42, X43, X44, X45, X46, X47, X48, X49, X50, X51, X52, X53, X54, X55, X56, X57, X58, X59, X60, X61, X62, X63, X64, X65, X66, X67, X68, X69, X70, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83, X84, X85, X86, X87, X88, X89, X90, X91, X92, X93, X94, X95, X96, X97, X98, X99, X100).

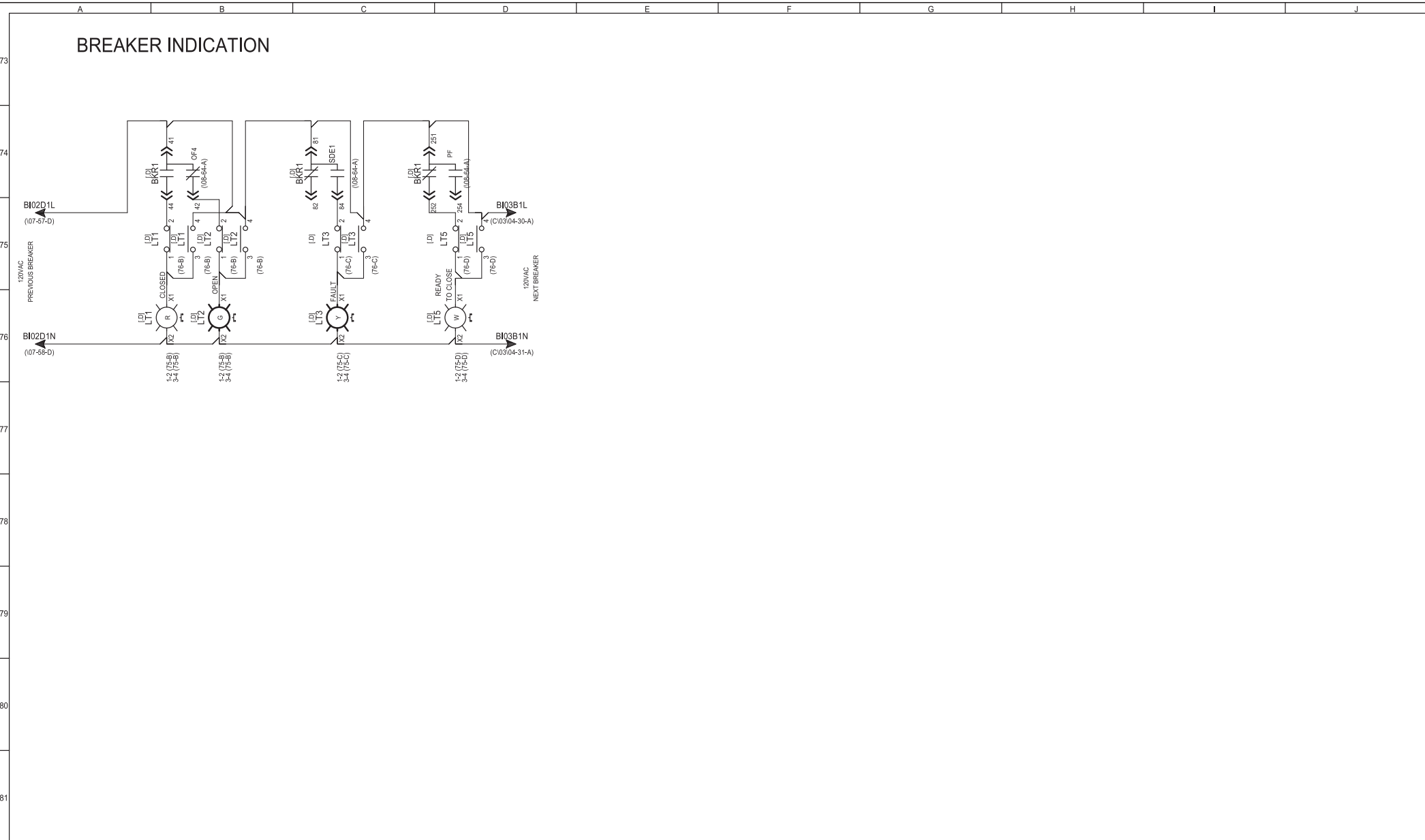
REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C			
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear			
					PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL B BREAKER			
					DRAWN BY: RS				
					VERIFIED BY:	DRAWING: C51900946-000010 -02-05			
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026	SECTION +02	PG 05 OF 09	REV



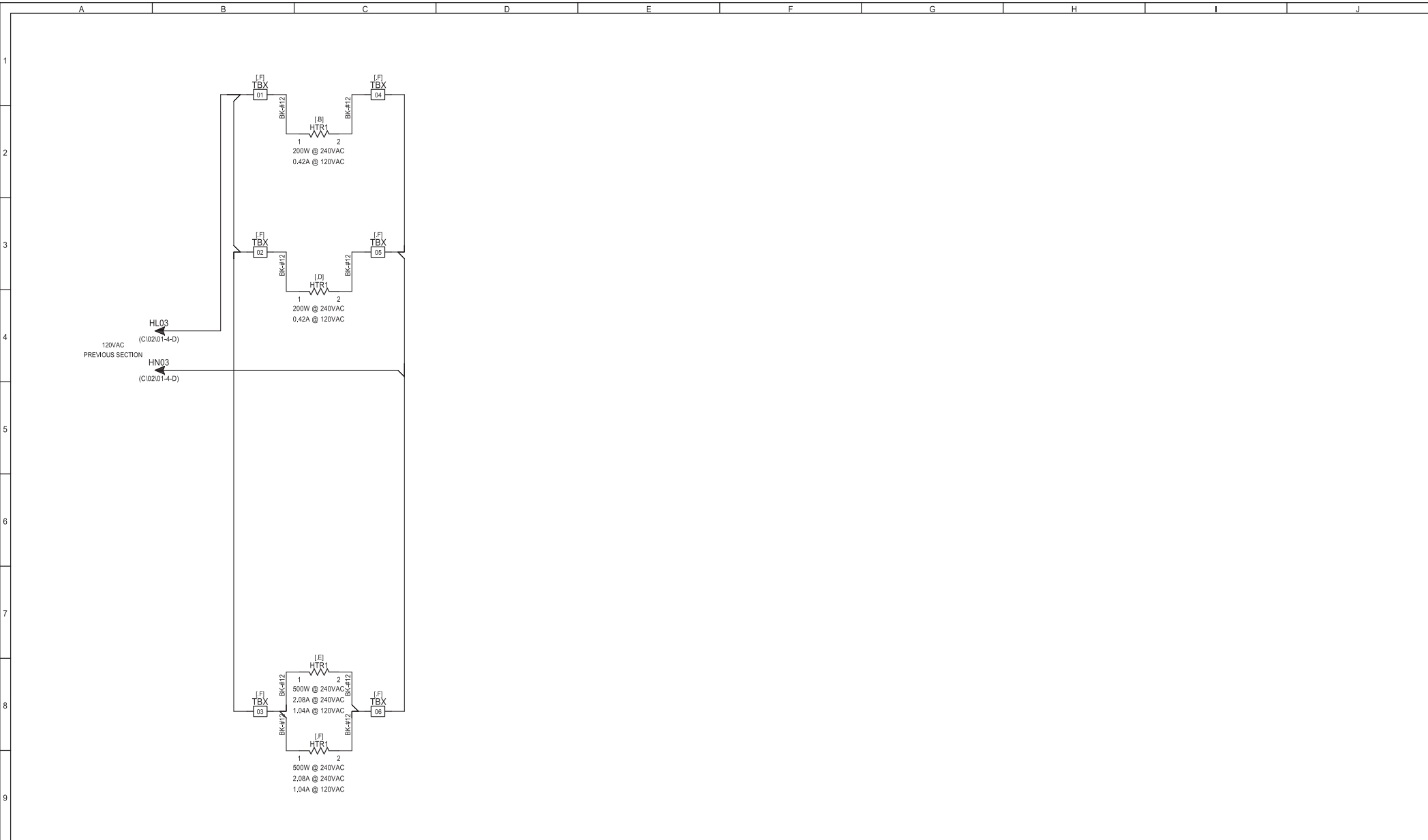
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
						JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
						PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL C BREAKER	
						DRAWN BY: RS		DRAWING: C51900946-000010 -02-07	
						VERIFIED BY:		SECTION +02	
						PROJECT STATUS: APPROVAL		PG 07 OF 09 REV	
				DATE: 4/3/2026					



REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C		
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear		
					PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL D BREAKER		
					DRAWN BY: RS		DRAWING: C51900946-000010 -02-08		
					VERIFIED BY:		SECTION +02		
						PROJECT STATUS: APPROVAL	DATE: 4/3/2026	PG 08 OF 09	REV



REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C			
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear			
					PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL D BREAKER			
					DRAWN BY: RS		DRAWING: C51900946-000010 -02-09			
					VERIFIED BY:		SECTION +02			
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026		PG 09 OF 09	



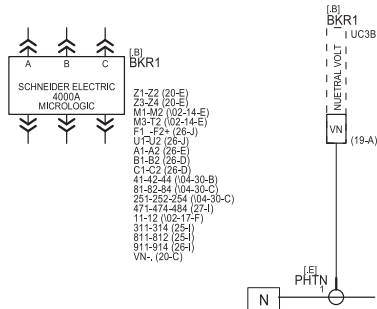
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C				
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear				
					PROJECT ENGR: R. Salgado		DRAWING TYPE: STRIP HEATERS				
					DRAWN BY: RS						
					VERIFIED BY:		DRAWING: C51900946-000010 -03-01				
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026		SECTION +03		PG 01 OF 06 REV



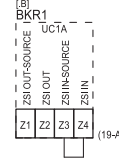
SQUARE D
by **Schneider** Electric

JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
PROJECT ENGR: R. Salgado		DRAWING TYPE: M DGF	
DRAWN BY: RS			
VERIFIED BY:		DRAWING: C51900946-000010 -03-02	
PROJECT STATUS: APPROVAL	DATE: 4/3/2026	SECTION +03	PG 02 OF 06 REV

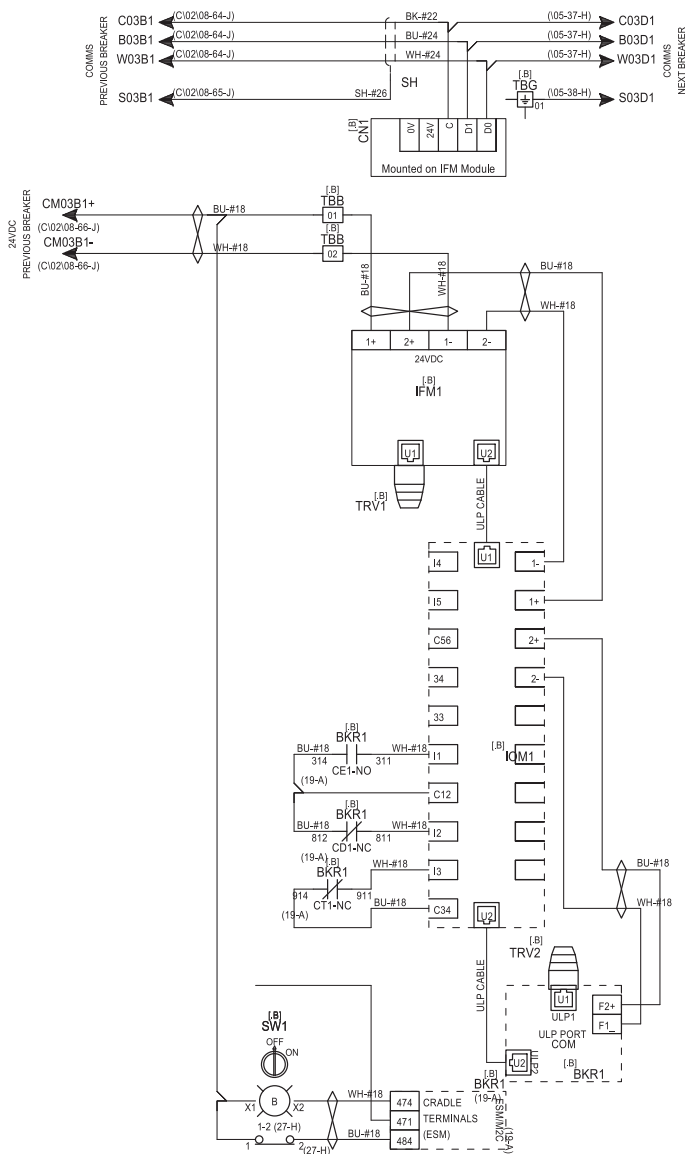
MASTER BREAKER SYMBOL



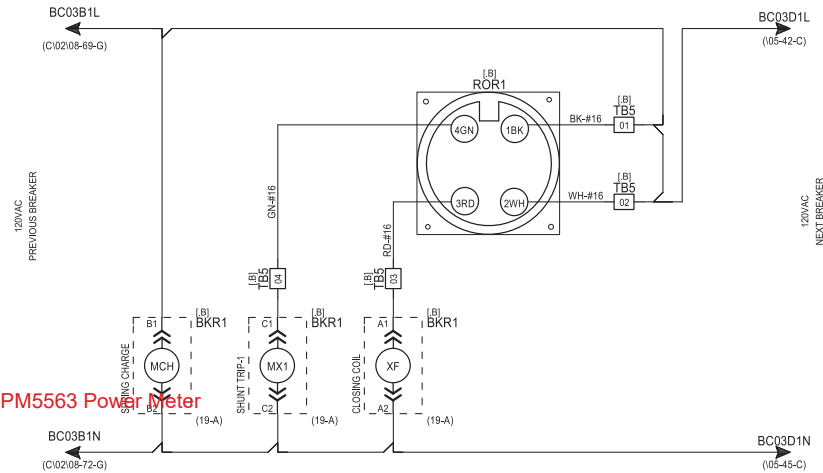
FACTORY JUMPERS



COMMUNICATIONS



BREAKER CONTROL

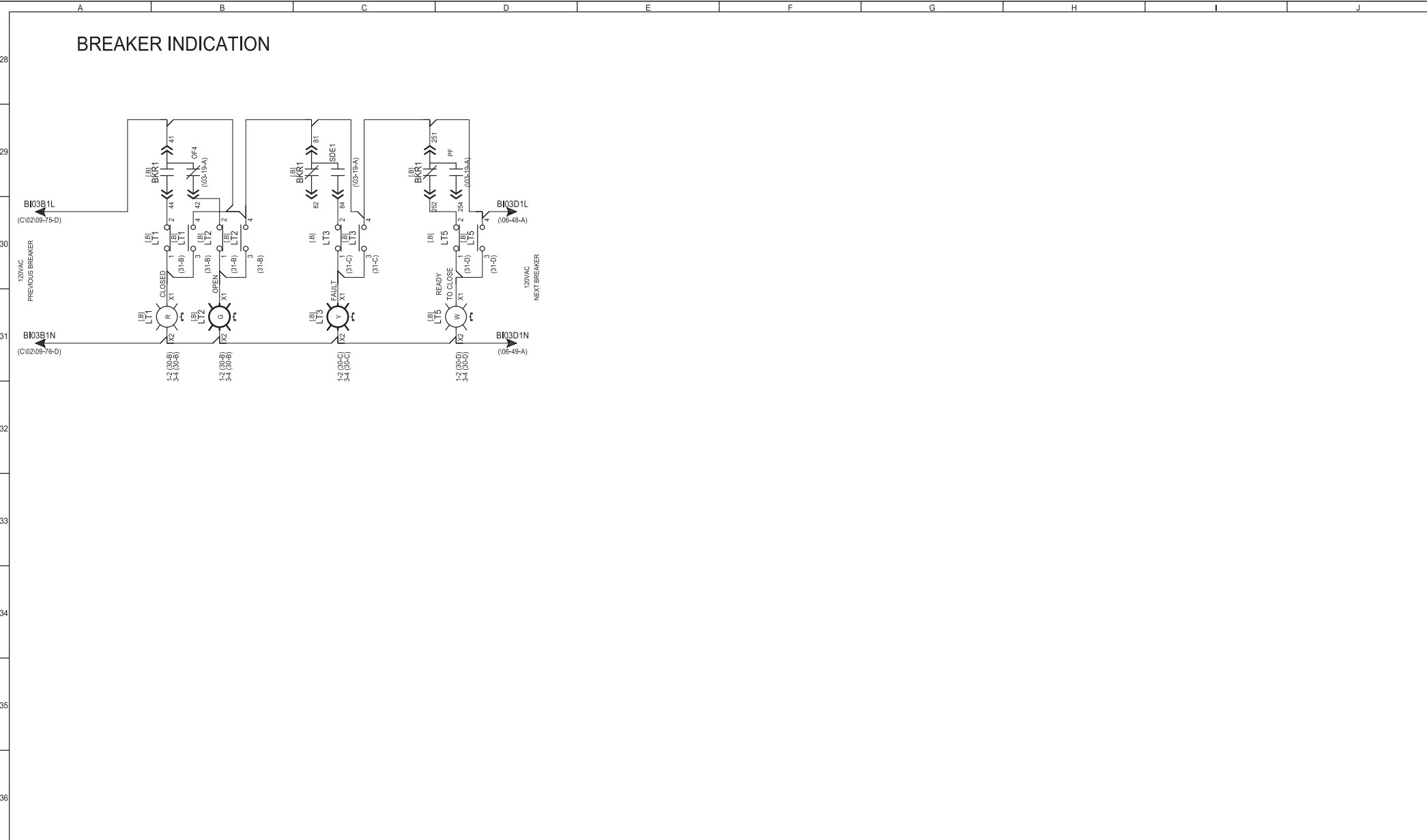


NOTE: PM244 Power Meter will be changed to PM5563 Power Meter

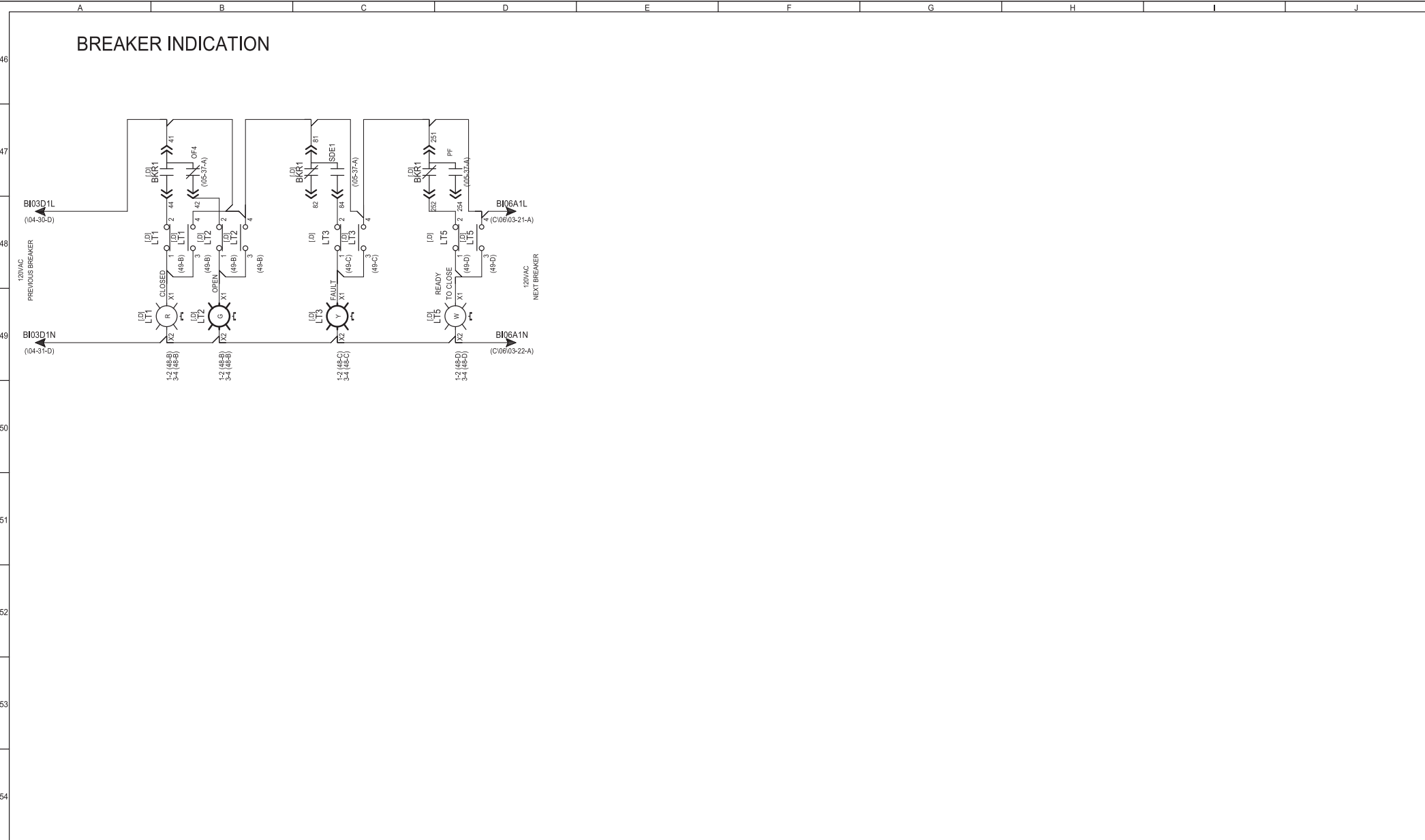
REV	DESCRIPTION	BY	DATE



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -03-03
VERIFIED BY:	SECTION +03
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
PG 03 OF 06	REV



REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
						JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
						PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER
						DRAWN BY: RS	
						VERIFIED BY:	DRAWING: C51900946-000010 -03-04
						PROJECT STATUS: APPROVAL	SECTION +03
						DATE: 4/3/2026	PG 04 OF 06
						REV	

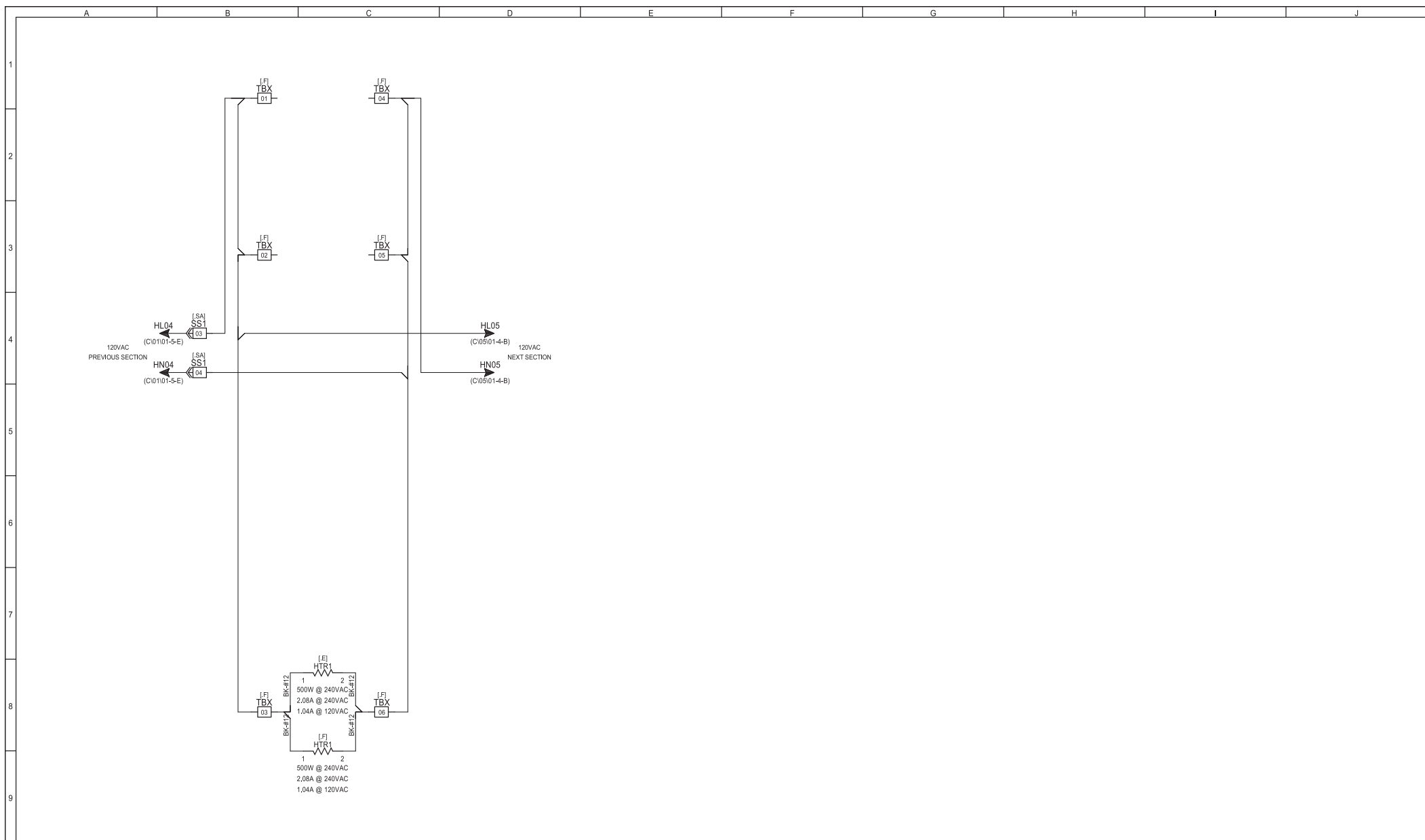


REV	DESCRIPTION	BY	DATE

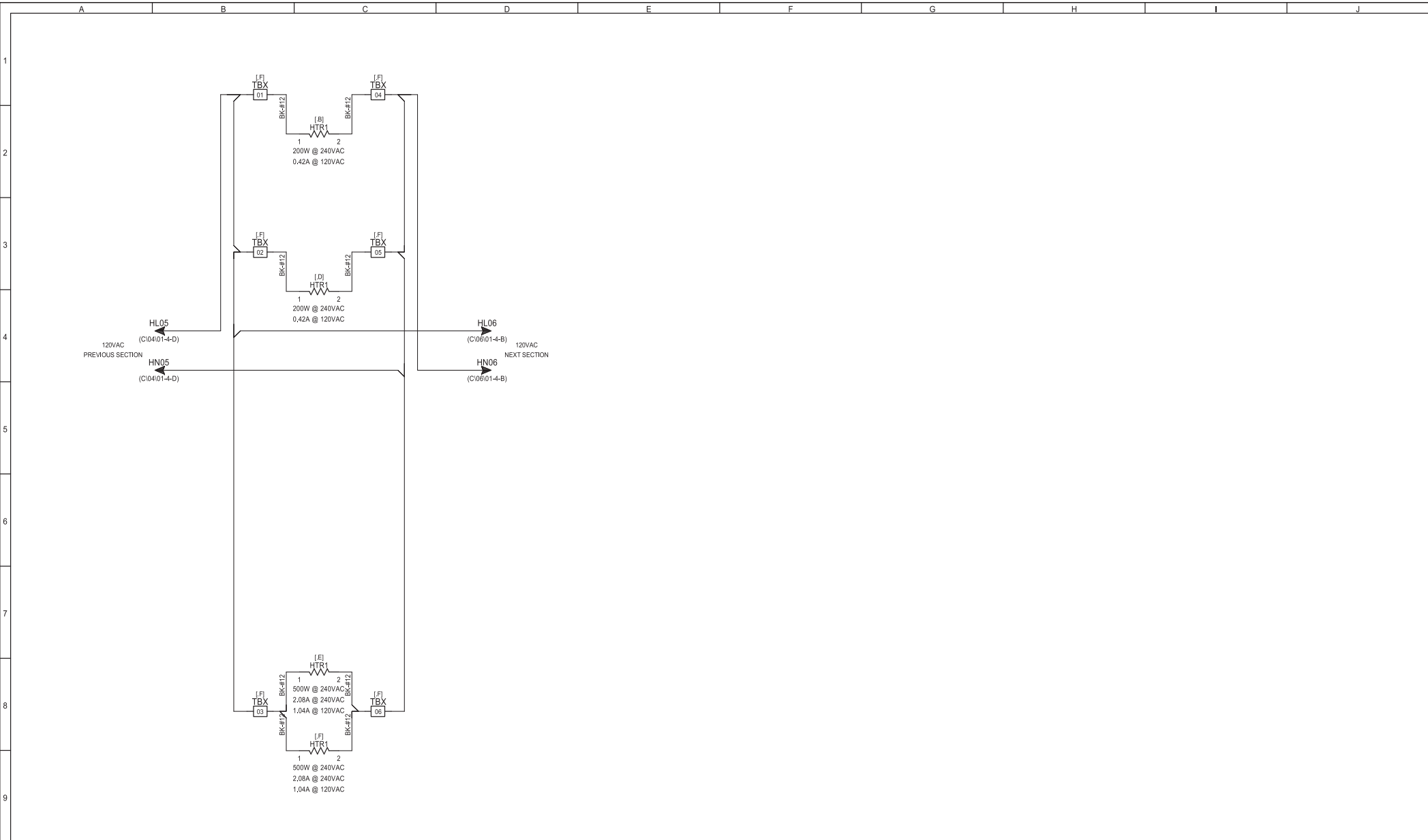


by Schneider Electric

JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL D BREAKER	
DRAWN BY: RS		DRAWING: C51900946-000010 -03-06	
VERIFIED BY:		SECTION +03	
PROJECT STATUS: APPROVAL		DATE: 4/3/2026	PG 06 OF 06 REV

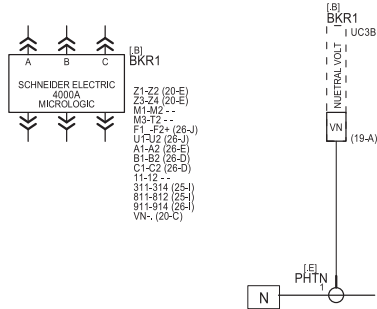


REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C				
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear				
					PROJECT ENGR: R. Salgado		DRAWING TYPE: STRIP HEATERS				
					DRAWN BY: RS		DRAWING: C51900946-000010 -04-01				
					VERIFIED BY:						
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026		SECTION +04		PG 01 OF 01 REV

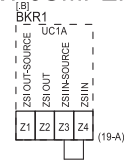


REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
						JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
						PROJECT ENGR: R. Salgado	DRAWING TYPE: STRIP HEATERS
						DRAWN BY: RS	
						VERIFIED BY:	DRAWING: C51900946-000010 -05-01
						PROJECT STATUS: APPROVAL	DATE: 4/3/2026
						SECTION +05	PG 01 OF 04 REV

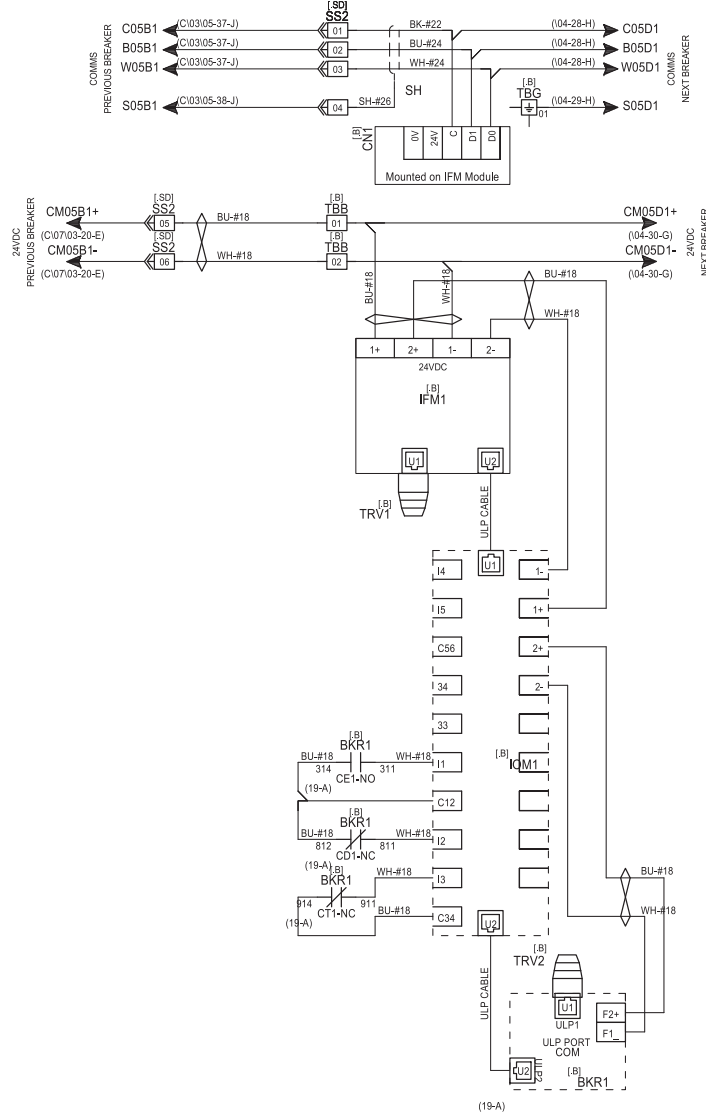
MASTER BREAKER SYMBOL



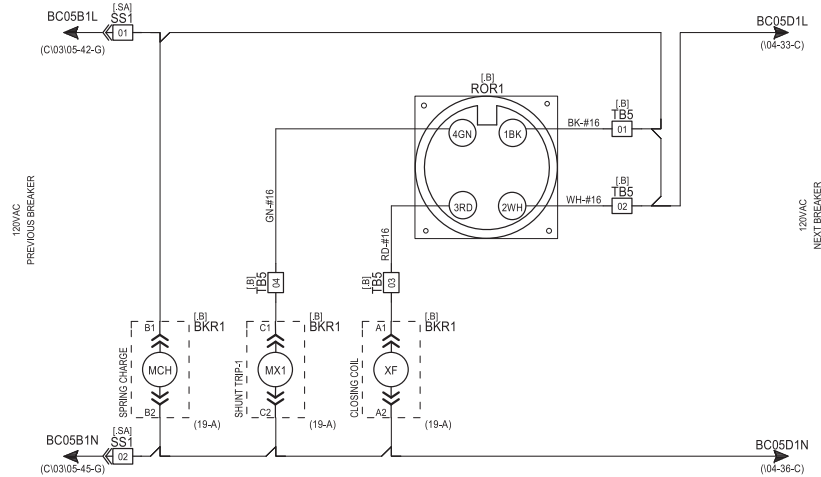
FACTORY JUMPERS



COMMUNICATIONS



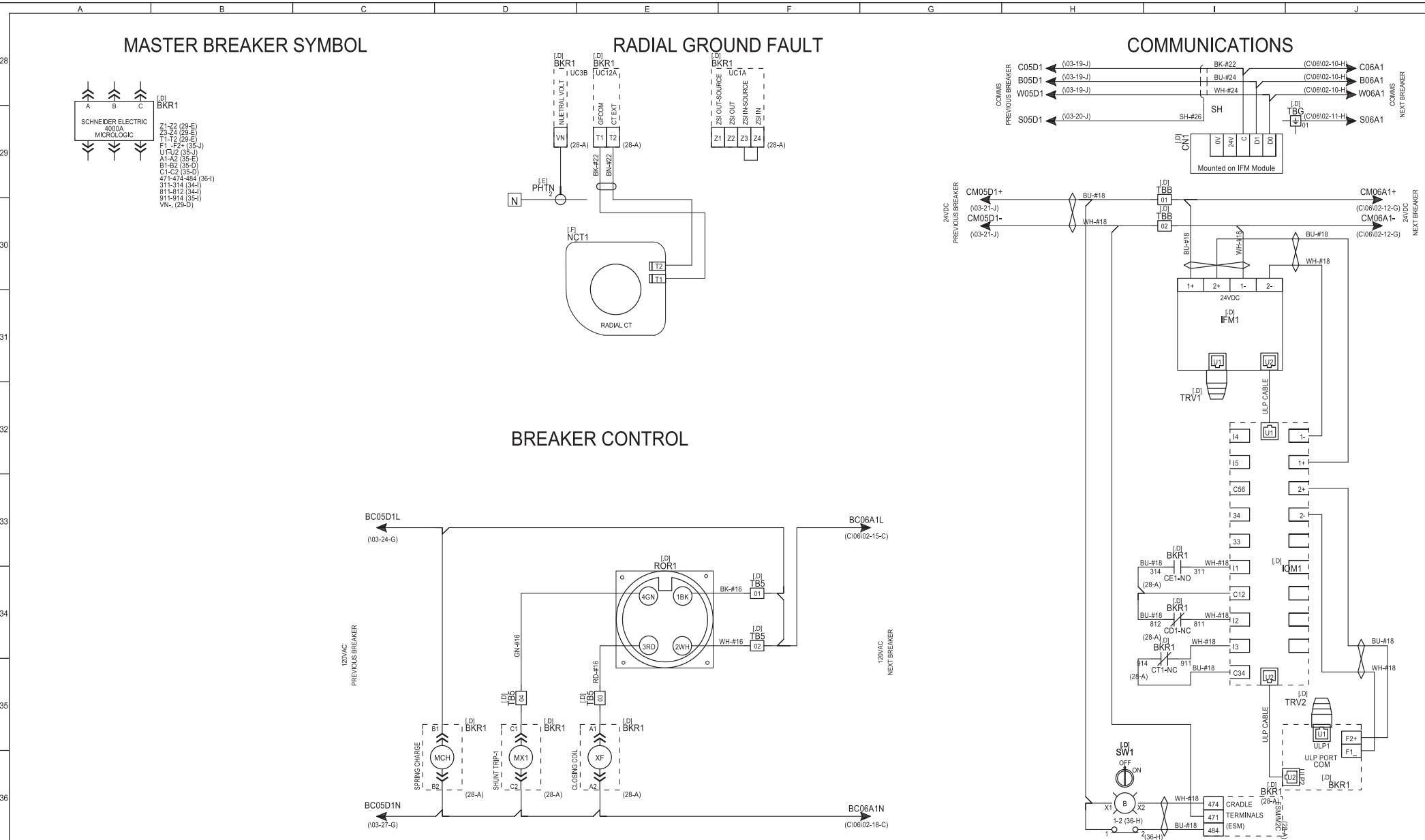
BREAKER CONTROL



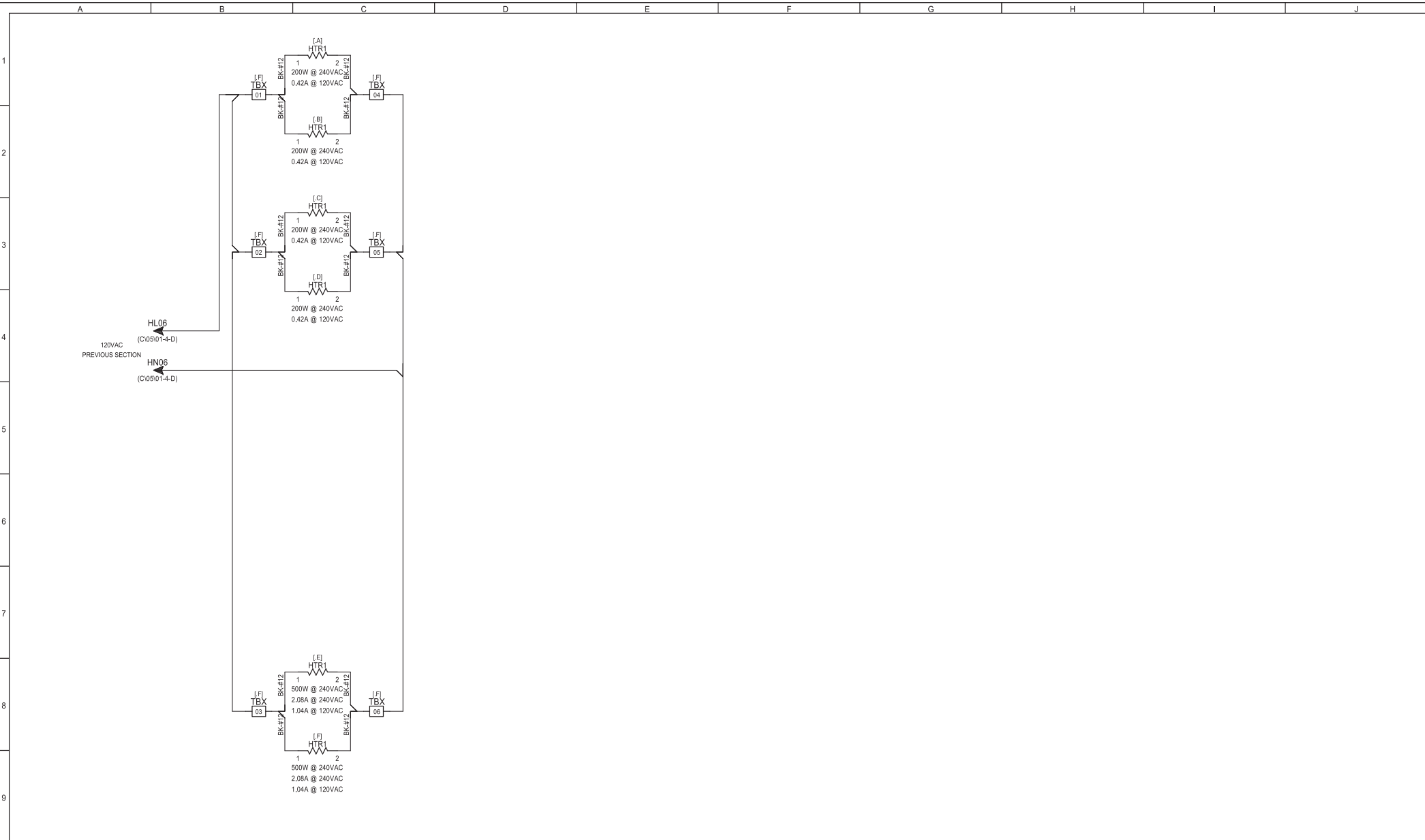
REV	DESCRIPTION	BY	DATE



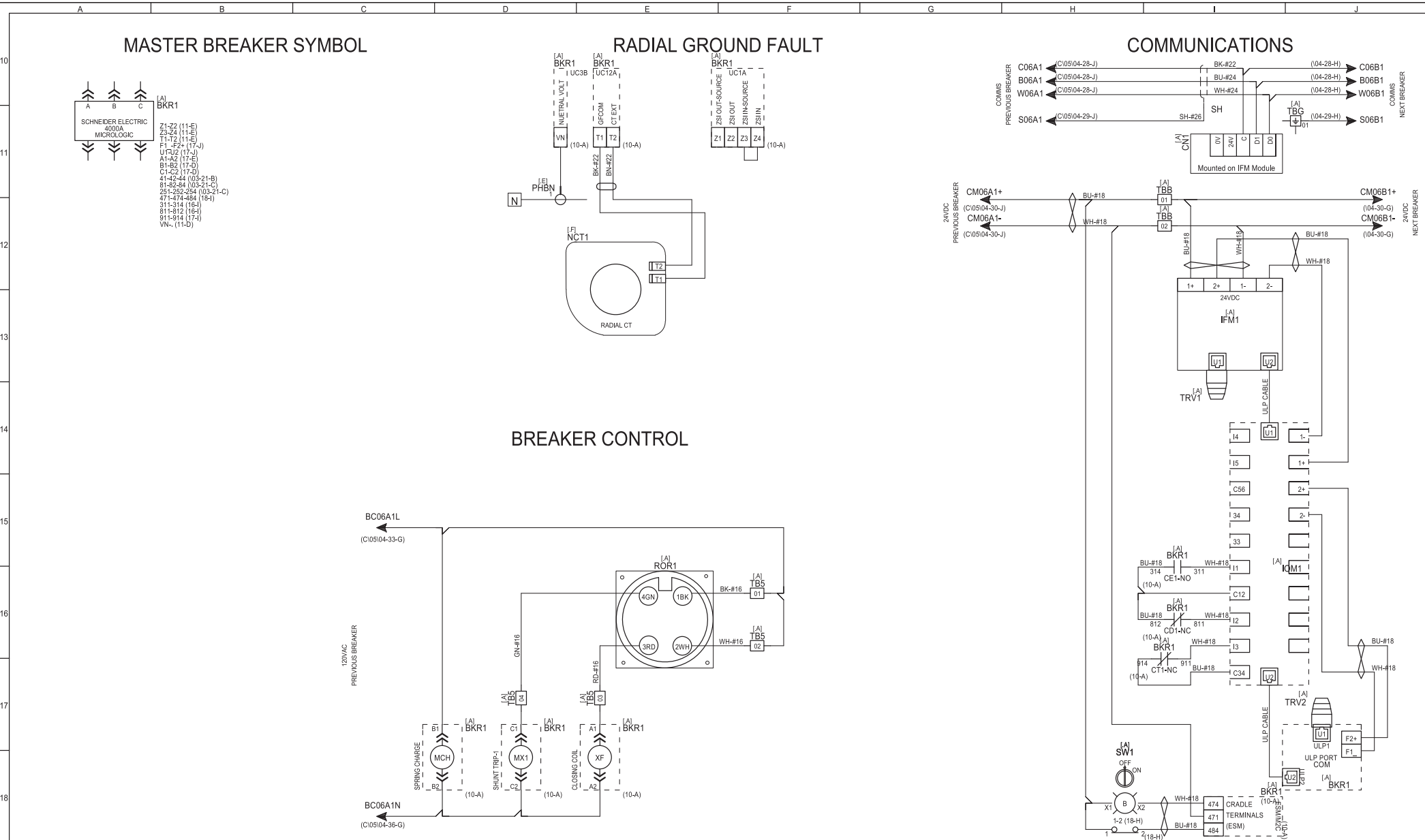
JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -05-03
VERIFIED BY:	SECTION +05
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 03 OF 04 REV



REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C		
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear		
					PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL D BREAKER		
					DRAWN BY: RS			
					VERIFIED BY:	DRAWING: C51900946-000010 -05-04		
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026	SECTION +05	PG 04 OF 04



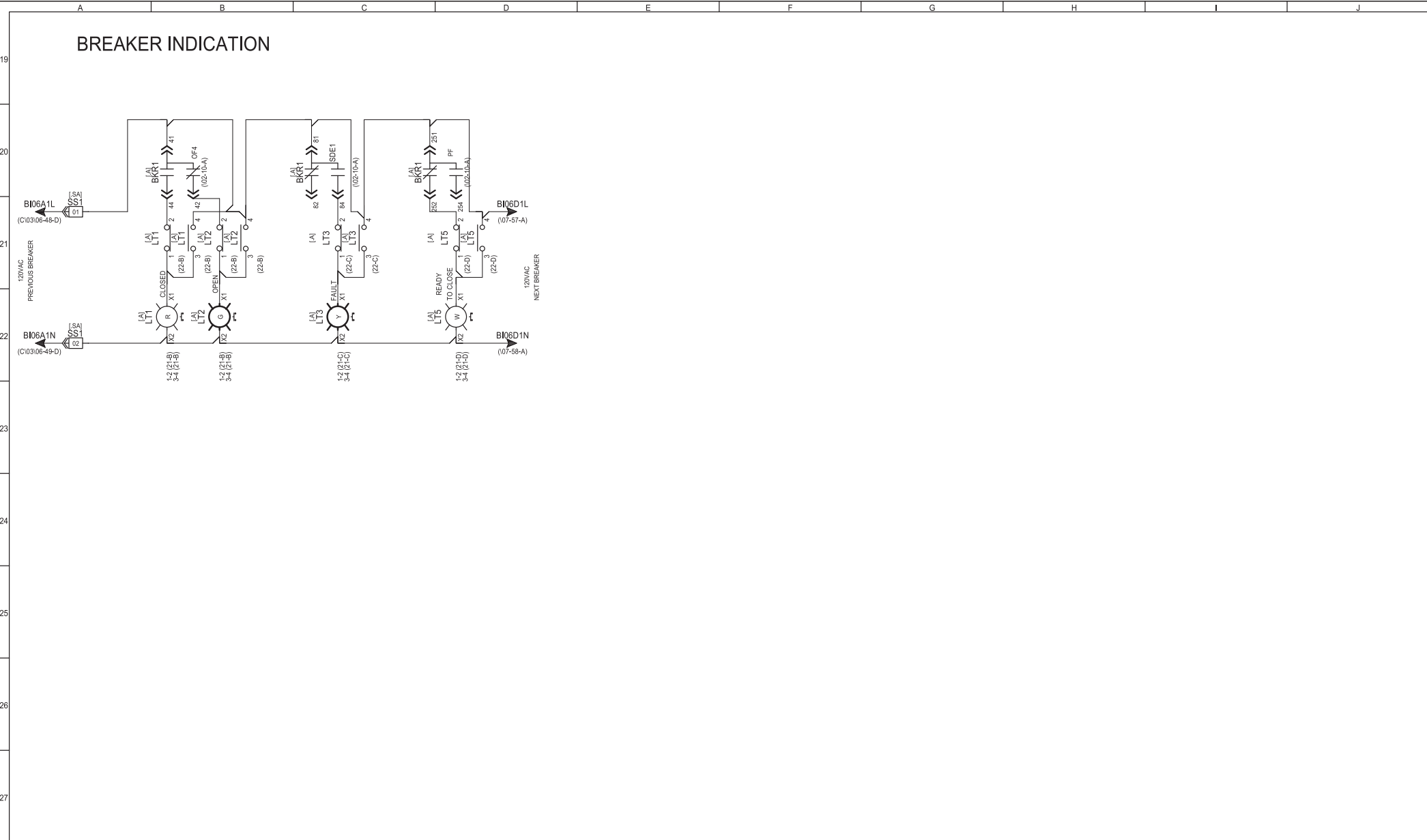
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C				
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear				
					PROJECT ENGR: R. Salgado		DRAWING TYPE: STRIP HEATERS				
					DRAWN BY: RS		DRAWING: C51900946-000010 -06-01				
					VERIFIED BY:						
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026		SECTION +06		PG 01 OF 07 REV



REV	DESCRIPTION	BY	DATE

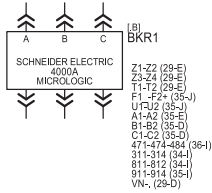


JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL A BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -06-02
VERIFIED BY:	SECTION +06
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 02 OF 07 REV

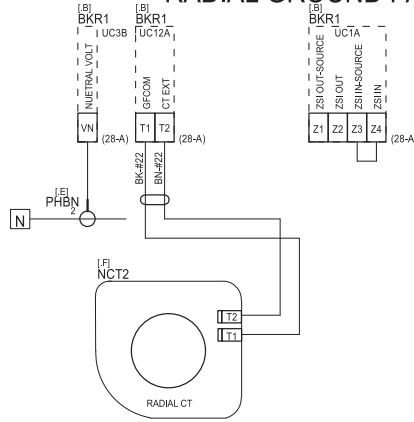


REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C		
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear		
					PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL A BREAKER		
					DRAWN BY: RS	DRAWING: C51900946-000010 -06-03		
					VERIFIED BY:	SECTION +06		
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026	PG 03 OF 07	REV

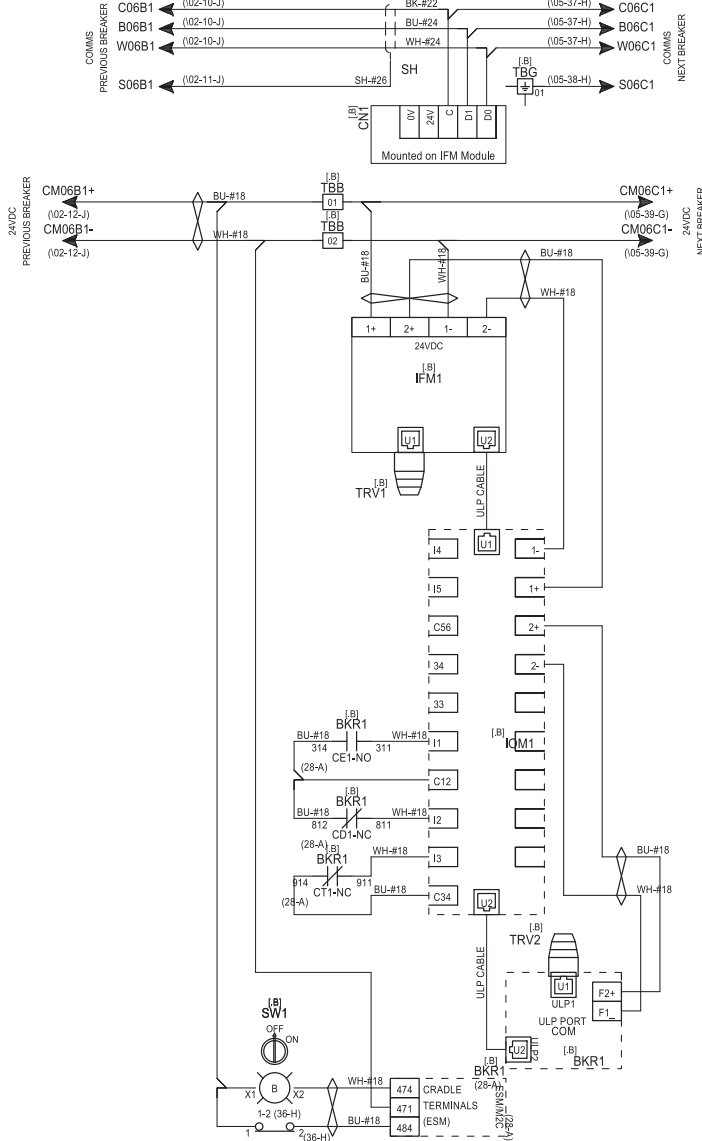
MASTER BREAKER SYMBOL



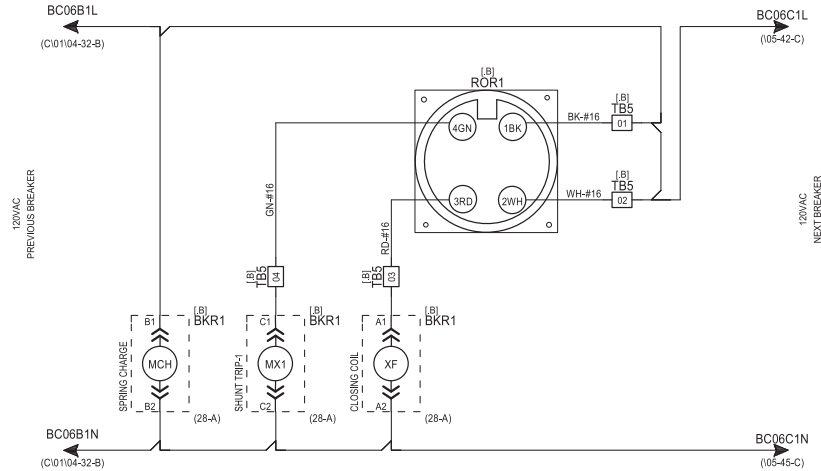
RADIAL GROUND FAULT



COMMUNICATIONS



BREAKER CONTROL

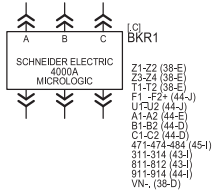


REV	DESCRIPTION	BY	DATE

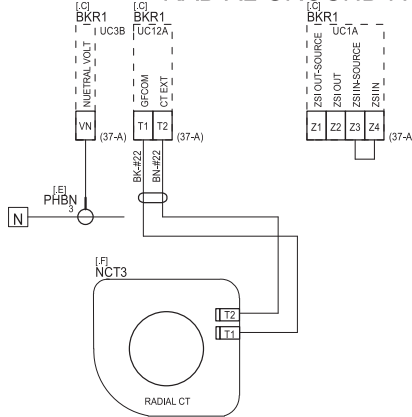


JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL B BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -06-04
VERIFIED BY:	SECTION +06
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 04 OF 07 REV

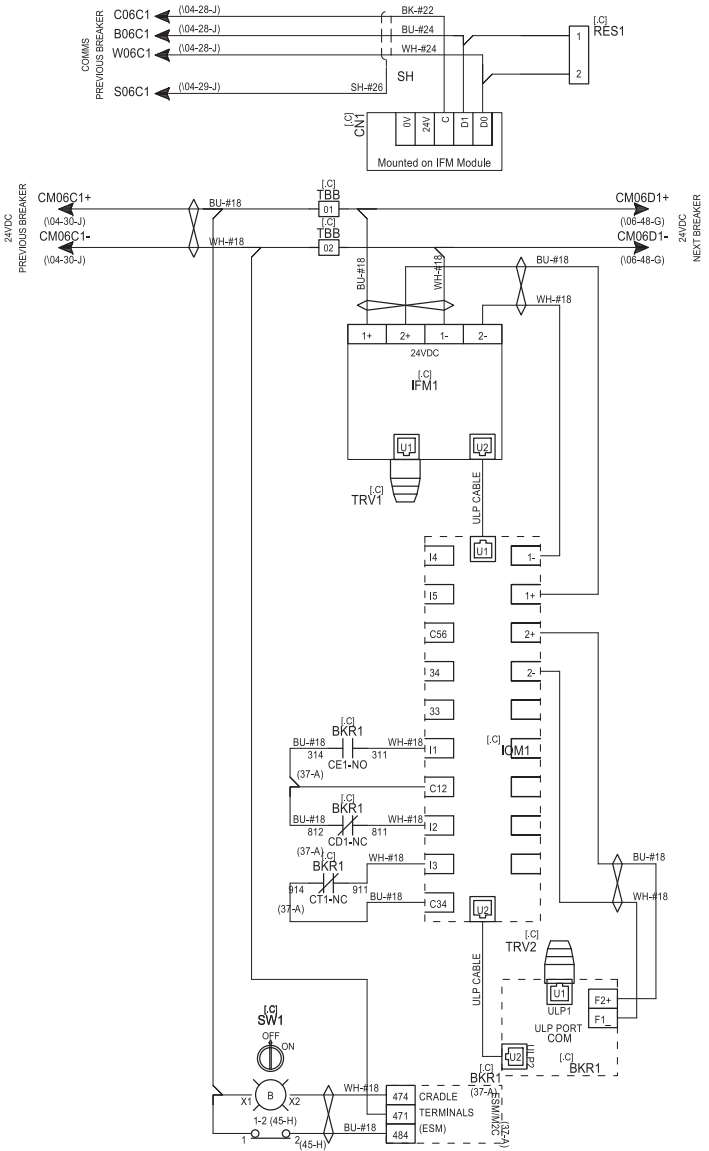
MASTER BREAKER SYMBOL



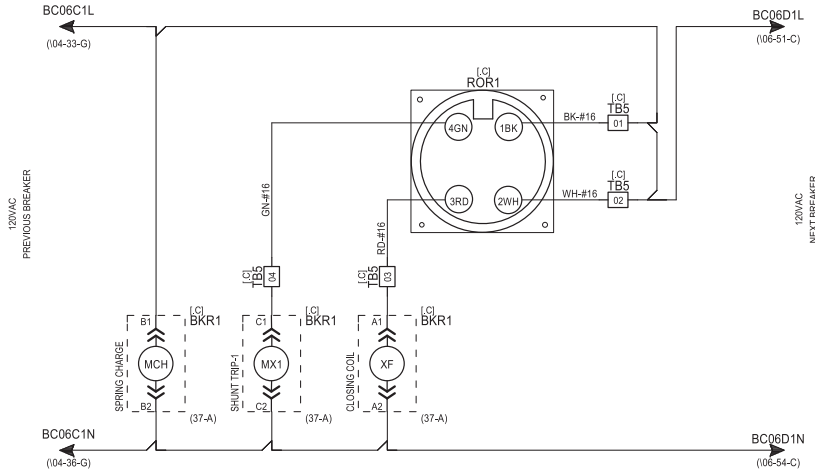
RADIAL GROUND FAULT



COMMUNICATIONS

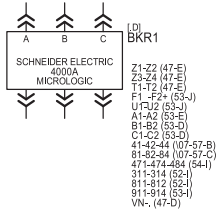


BREAKER CONTROL

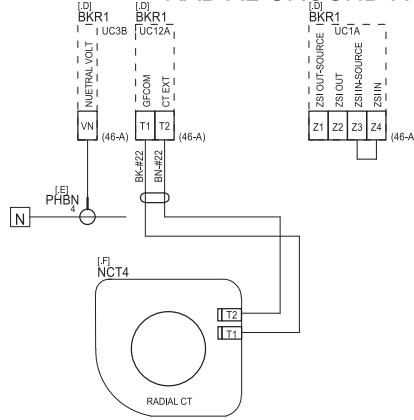


REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C	
						JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear	
						PROJECT ENGR: R. Salgado		DRAWING TYPE: CELL C BREAKER	
						DRAWN BY: RS		DRAWING: C51900946-000010 -06-05	
						VERIFIED BY:		SECTION +06	
						PROJECT STATUS: APPROVAL	DATE: 4/3/2026	PG 05 OF 07	REV

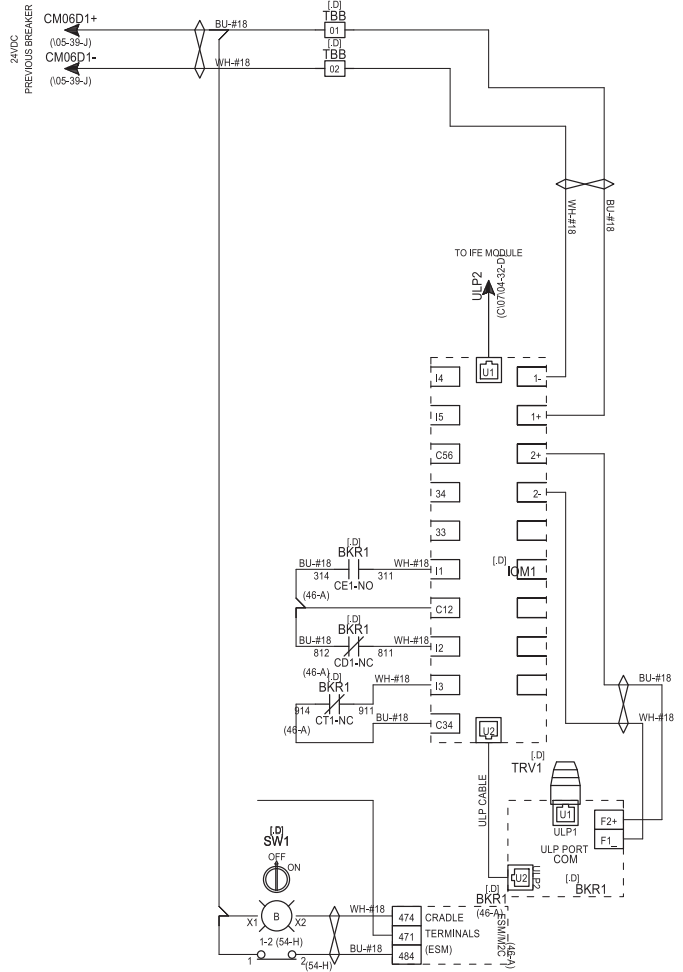
MASTER BREAKER SYMBOL



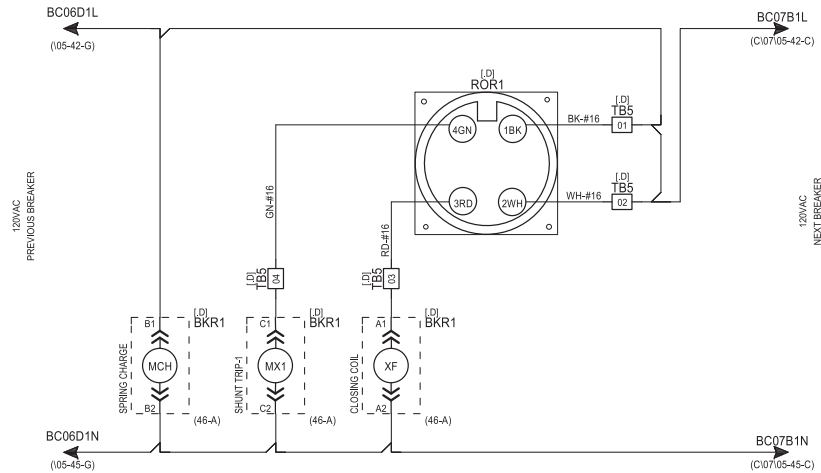
RADIAL GROUND FAULT



COMMUNICATIONS



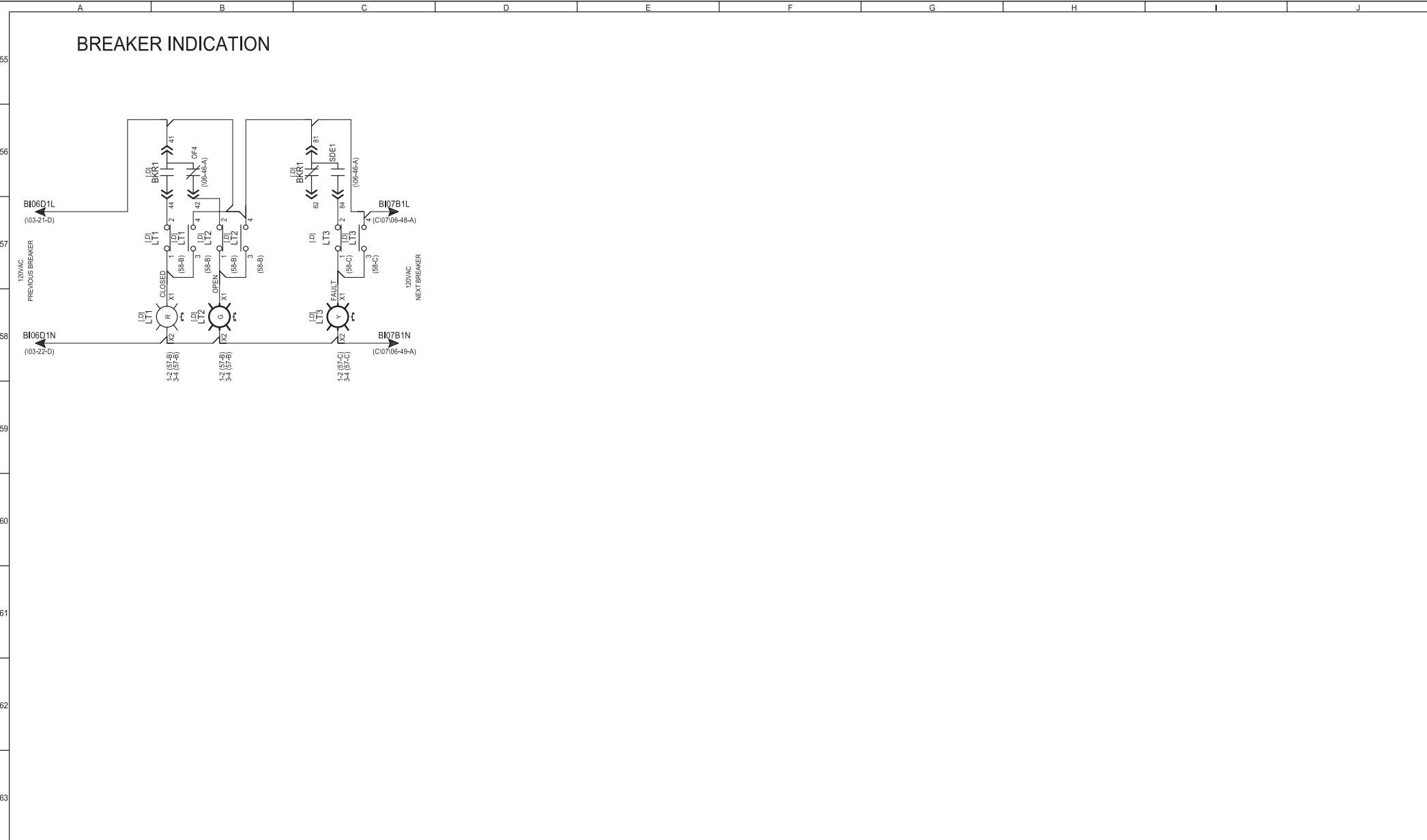
BREAKER CONTROL



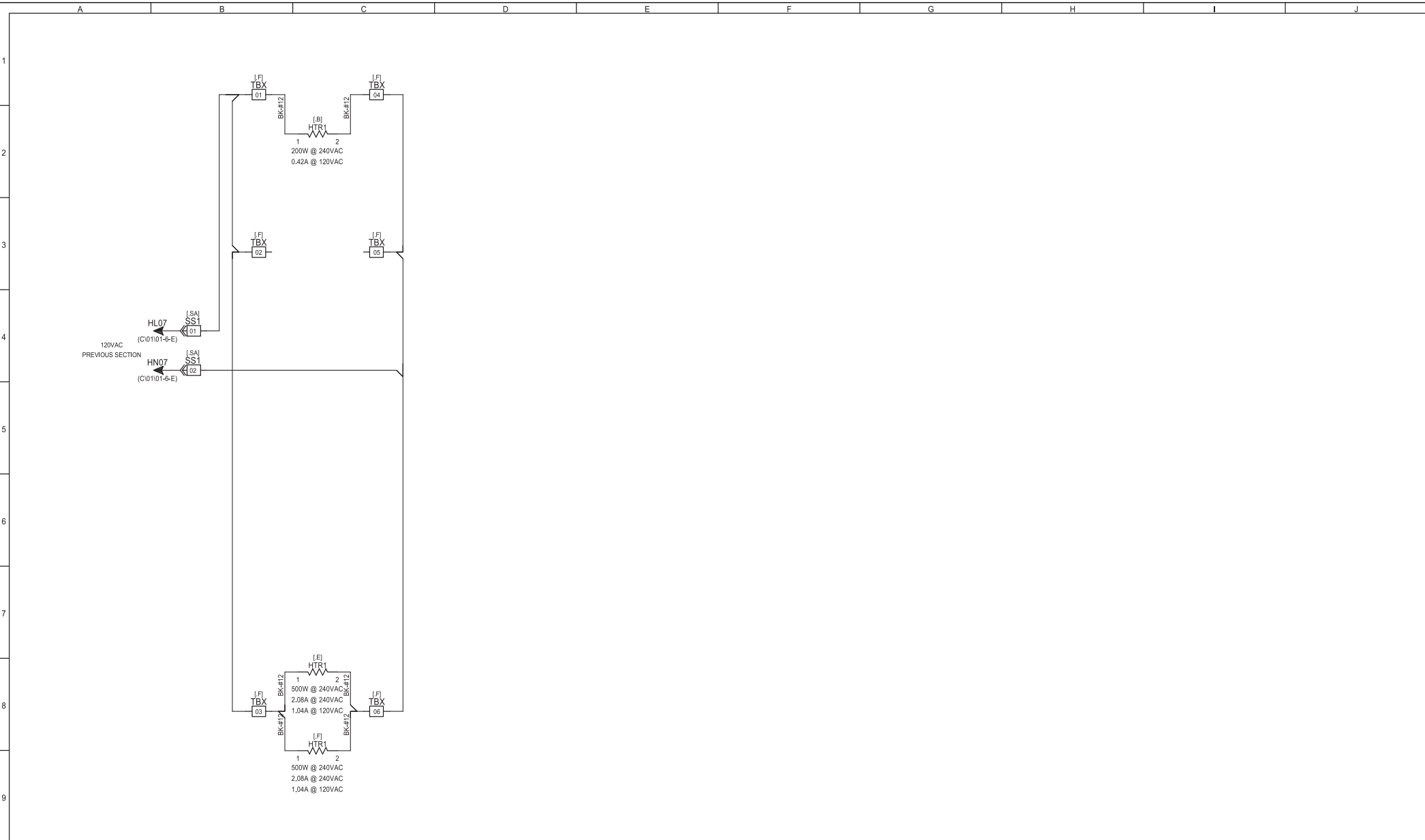
REV	DESCRIPTION	BY	DATE



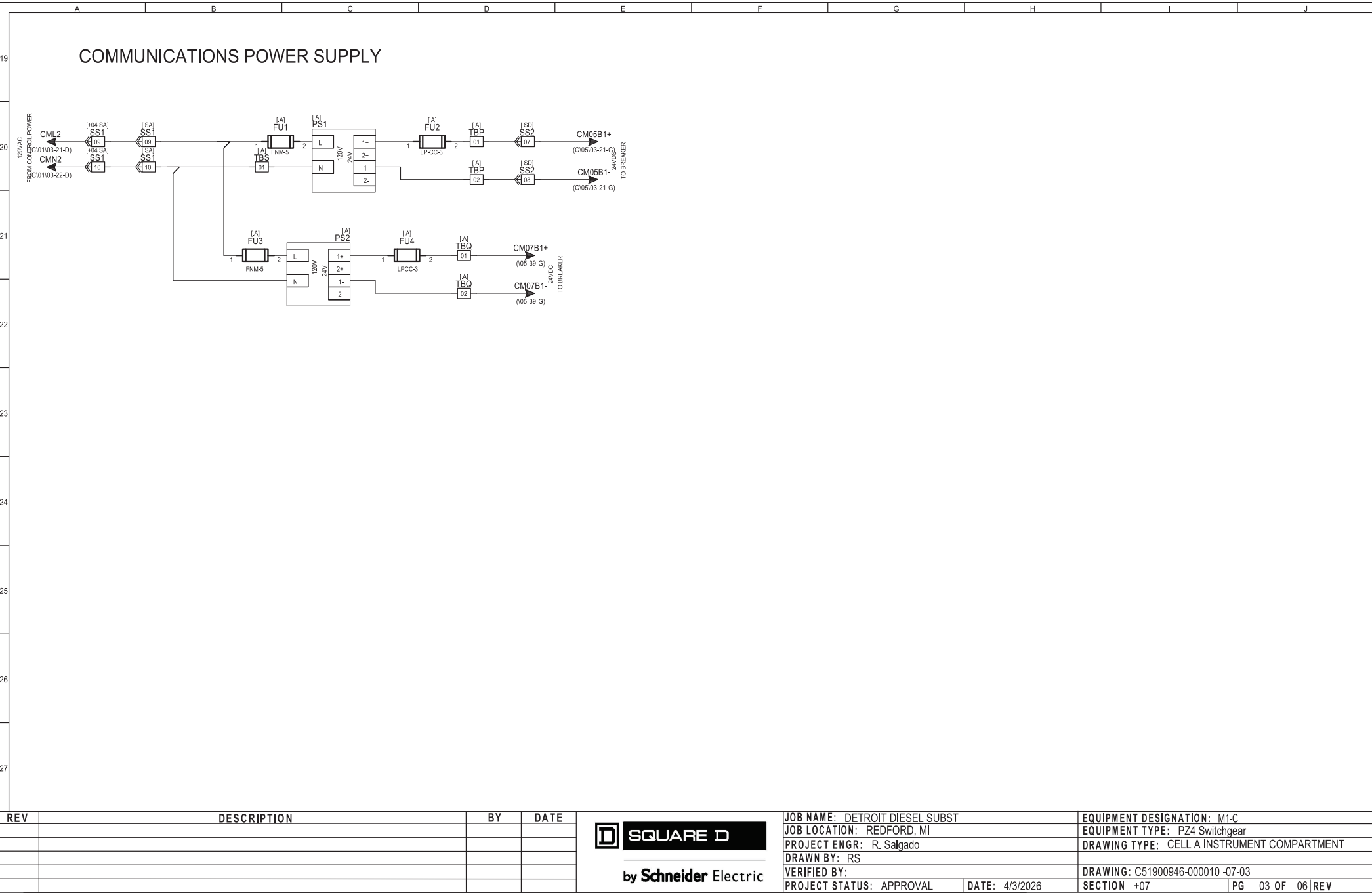
JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL D BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -06-06
VERIFIED BY:	SECTION +06
PROJECT STATUS: APPROVAL	PG 06 OF 07 REV



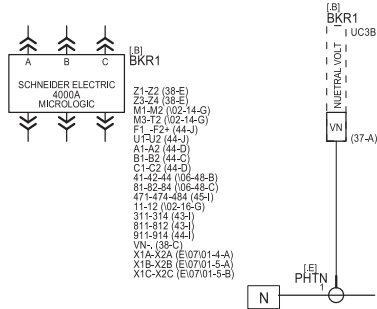
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric		JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
						JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
						PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL D BREAKER
						DRAWN BY: RS	
						VERIFIED BY:	DRAWING: C51900946-000010 -06-07
						PROJECT STATUS: APPROVAL	SECTION +06
						DATE: 4/3/2026	PG 07 OF 07 REV



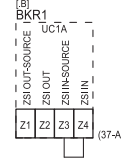
REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST		EQUIPMENT DESIGNATION: M1-C				
					JOB LOCATION: REDFORD, MI		EQUIPMENT TYPE: PZ4 Switchgear				
					PROJECT ENGR: R. Salgado		DRAWING TYPE: STRIP HEATERS				
					DRAWN BY: RS		DRAWING: C51900946-000010 -07-01				
					VERIFIED BY:						
					PROJECT STATUS: APPROVAL		DATE: 4/3/2026		SECTION +07		PG 01 OF 06 REV



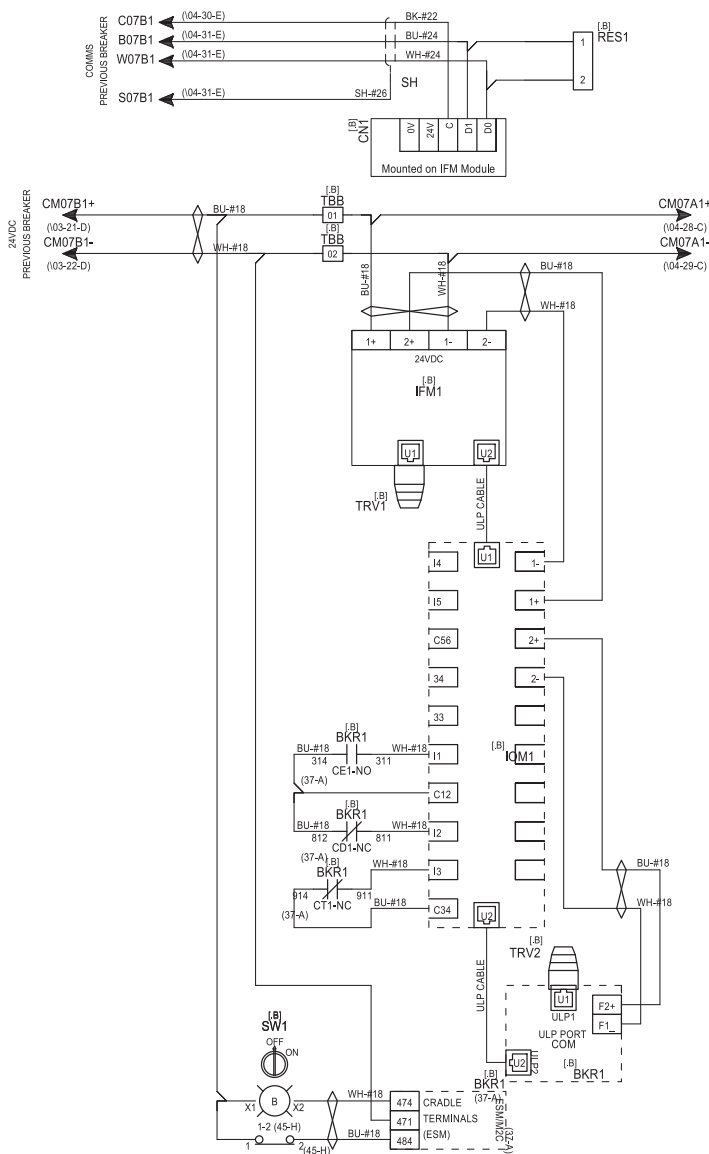
MASTER BREAKER SYMBOL



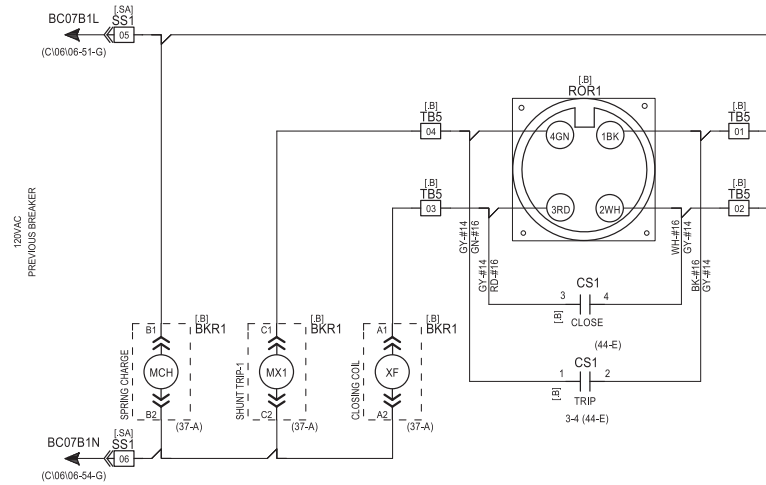
FACTORY JUMPERS



COMMUNICATIONS



BREAKER CONTROL



JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER
DRAWN BY: RS	DRAWING: C51900946-000010 -07-05
VERIFIED BY:	SECTION +07
PROJECT STATUS: APPROVAL	PG 05 OF 06 REV

Diagram illustrating the Breaker Indication circuit for a 120VAC system, showing the connection between the Previous Breaker, the Breaker (BKR1), and the Breaker Indication (BI) components.

The circuit is divided into three main sections, each representing a different breaker status:

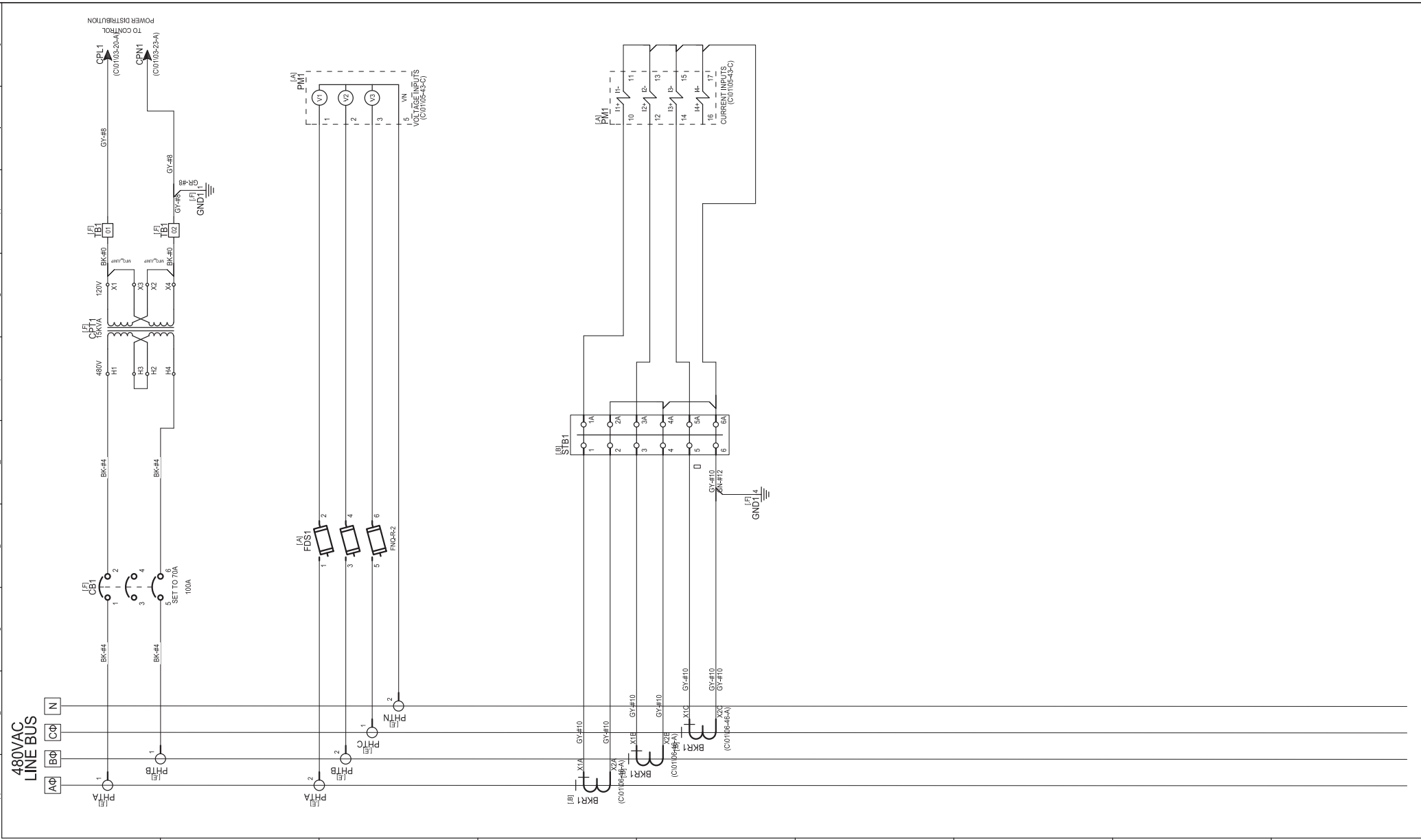
- Previous Breaker (C0607-57-C):** This section shows the connection from the Previous Breaker (C0607-57-C) to the Breaker (BKR1) and the Breaker Indication (BI) components. The circuit includes a 120VAC source, a switch (SS1), and a Breaker (BKR1) with a status indicator (BI) and a Breaker Indication (BI) component.
- Breaker (BKR1):** This section shows the connection from the Breaker (BKR1) to the Breaker Indication (BI) components. The circuit includes a Breaker (BKR1) with a status indicator (BI) and a Breaker Indication (BI) component.
- Breaker Indication (BI):** This section shows the connection from the Breaker Indication (BI) components to the Breaker (BKR1) and the Breaker Indication (BI) components. The circuit includes a Breaker Indication (BI) component and a Breaker (BKR1) with a status indicator (BI) and a Breaker Indication (BI) component.

The diagram also includes a detailed view of the Breaker Indication (BI) components, showing the connection between the Breaker Indication (BI) components and the Breaker (BKR1) and the Breaker Indication (BI) components.

The diagram is labeled with the following components:

- 120VAC
- PREVIOUS BREAKER
- BI07B1L
- BI07B1N
- BKR1
- BI
- SS1
- LT1
- LT2
- LT3
- OF4
- OF1
- OF2
- OF3
- OF4
- OF5
- OF6
- OF7
- OF8
- OF9
- OF10
- OF11
- OF12
- OF13
- OF14
- OF15
- OF16
- OF17
- OF18
- OF19
- OF20
- OF21
- OF22
- OF23
- OF24
- OF25
- OF26
- OF27
- OF28
- OF29
- OF30
- OF31
- OF32
- OF33
- OF34
- OF35
- OF36
- OF37
- OF38
- OF39
- OF40
- OF41
- OF42
- OF43
- OF44
- OF45
- OF46
- OF47
- OF48
- OF49
- OF50
- OF51
- OF52
- OF53
- OF54
- OF55
- OF56
- OF57
- OF58
- OF59
- OF60
- OF61
- OF62
- OF63
- OF64
- OF65
- OF66
- OF67
- OF68
- OF69
- OF70
- OF71
- OF72
- OF73
- OF74
- OF75
- OF76
- OF77
- OF78
- OF79
- OF80
- OF81
- OF82
- OF83
- OF84
- OF85
- OF86
- OF87
- OF88
- OF89
- OF90
- OF91
- OF92
- OF93
- OF94
- OF95
- OF96
- OF97
- OF98
- OF99
- OF100

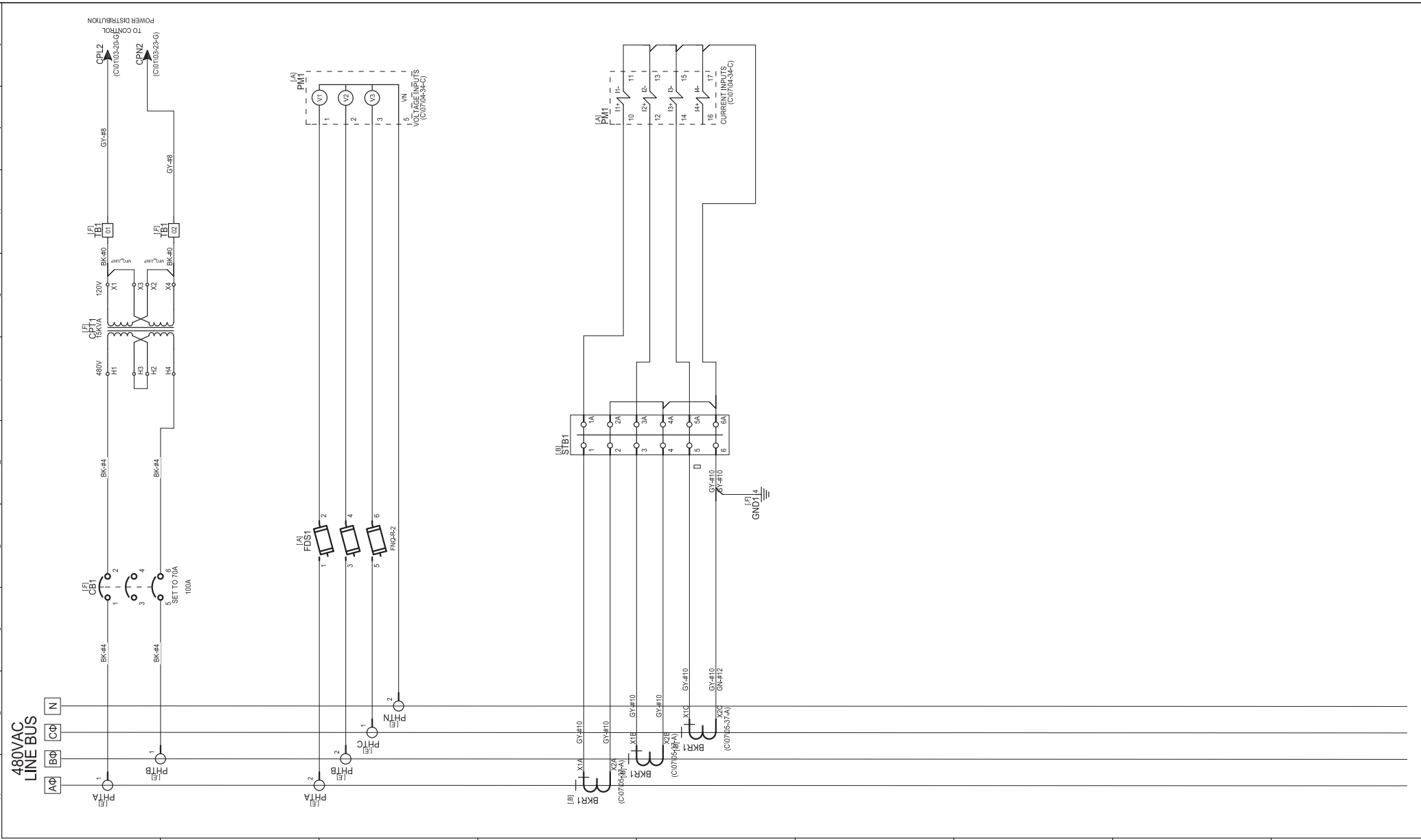
REV	DESCRIPTION	BY	DATE	 Square D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C			
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear			
					PROJECT ENGR: R. Salgado	DRAWING TYPE: CELL BC BREAKER			
					DRAWN BY: RS				
					VERIFIED BY:	DRAWING: C51900946-000010 -07-06			
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026	SECTION +07	PG 06 OF 06	REV



REV	DESCRIPTION	BY	DATE					
1								
2								
3								
4								
5								
6								
7								
8								
9								



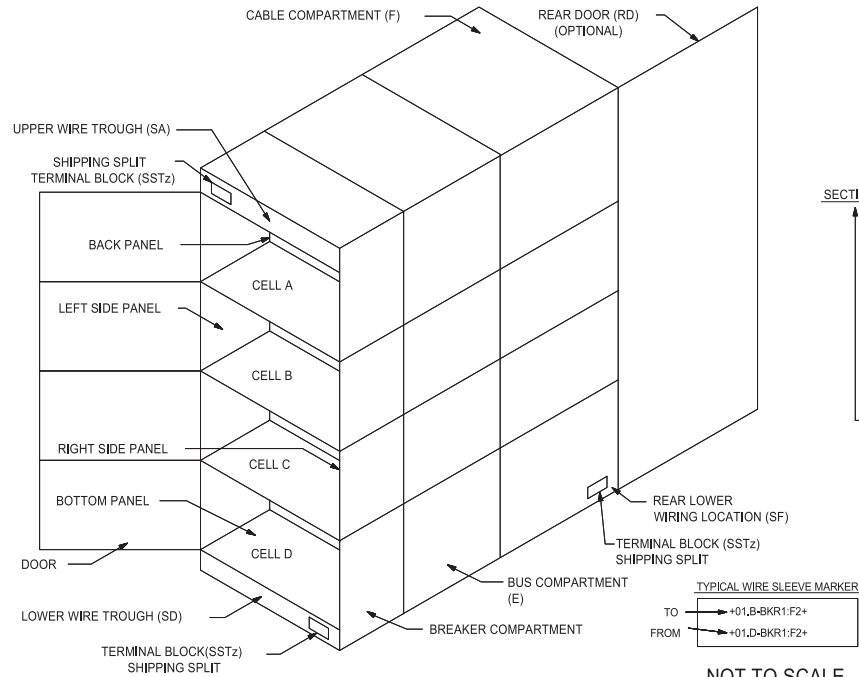
JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: LINE SIDE ELEMENTARY
DRAWN BY: RS	DRAWING: E51900946-000010 -01-01
VERIFIED BY:	SECTION +01
PROJECT STATUS: APPROVAL	PG 01 OF 01 REV
DATE: 4/3/2026	



REV	DESCRIPTION	BY	DATE	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
				JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
				PROJECT ENGR: R. Salgado	DRAWING TYPE: LINE SIDE ELEMENTARY
				DRAWN BY: RS	DRAWING: E51900946-000010 -07-01
				VERIFIED BY:	SECTION +07
				PROJECT STATUS: APPROVAL	PG 01 OF 01 REV



STANDARD LAYOUT FOR TYPICAL FOUR HIGH SWITCHGEAR/SWITCHBOARD



SECTION.CELL-DEVICE:PIN

COMPARTMENT OR CELL SUBDIVISION
1-4=EACH COMPARTMENT OR CELL MAY BE SUBDIVIDED.
SECTION LOCATION = A,B,C,D,E,F,W

A = TOP CELL
B = SECOND TO TOP CELL
C = SECOND TO BOTTOM CELL
D = BOTTOM CELL
E = BUS COMPARTMENT
F = CABLE COMPARTMENT
W = N3R WALKIN SECTION
SA = UPPER WIRE TROUGH
SD = LOWER WIRE TROUGH
SF = REAR LOWER WIRING LOCATION
J = ROOF

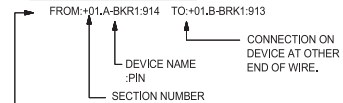
SECTION NUMBER

WHEN VIEWING LINE UP FROM THE FRONT,
THE LEFT MOST VERTICAL SECTION IS SECTION 01.

DEVICE DESIGNATIONS

TBz = TERMINAL BLOCK,
BKRz = CIRCUIT BREAKER,
CRz = CONTROL RELAY,
PMz = POWER METER,
SPDz = SURGE PROTECTIVE DEVICE/TVSS,
SSz = SHIPPING SPLIT CONNECTOR,
STBz = SHORTING TERMINAL BLOCK,
THz = THERMOSTAT,
GNDz = SECTION GEN BUS.

FROM/TO WIRING INFORMATION

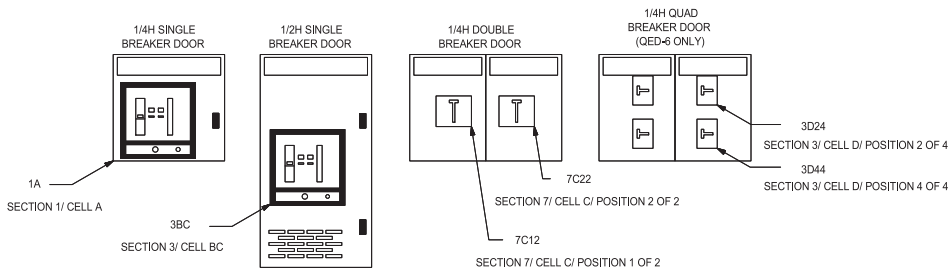


EXPLANATION

WIRE CONNECTS TO THIS DEVICE BKR1, IN CELL A, PIN 914.
THE OTHER END OF THE WIRE CONNECTS TO
DEVICE "BKR1", IN CELL B, PIN "913", BOTH DEVICES
ARE LOCATED IN SECTION 01.

NOT TO SCALE

CELL DOOR BREAKER PLACEMENT DESIGNATION



EXPLANATION

FIRST NUMBER INDICATES SECTION (SEE NOTE 1)
SECOND LETTER INDICATES CELL (SEE NOTE 1)
THIRD NUMBER INDICATES BREAKER POSITION WITHIN CELL

NOTE:

1. CELL DOOR DESIGNATIONS WITH ONLY SECTION AND CELL INDICATION NUMBERS IMPLY A SINGLE BREAKER DESIGNATION,
2. BREAKER POSITION DESIGNATIONS ARE ORIENTED FROM LEFT TO RIGHT, THEN TOP TO BOTTOM.



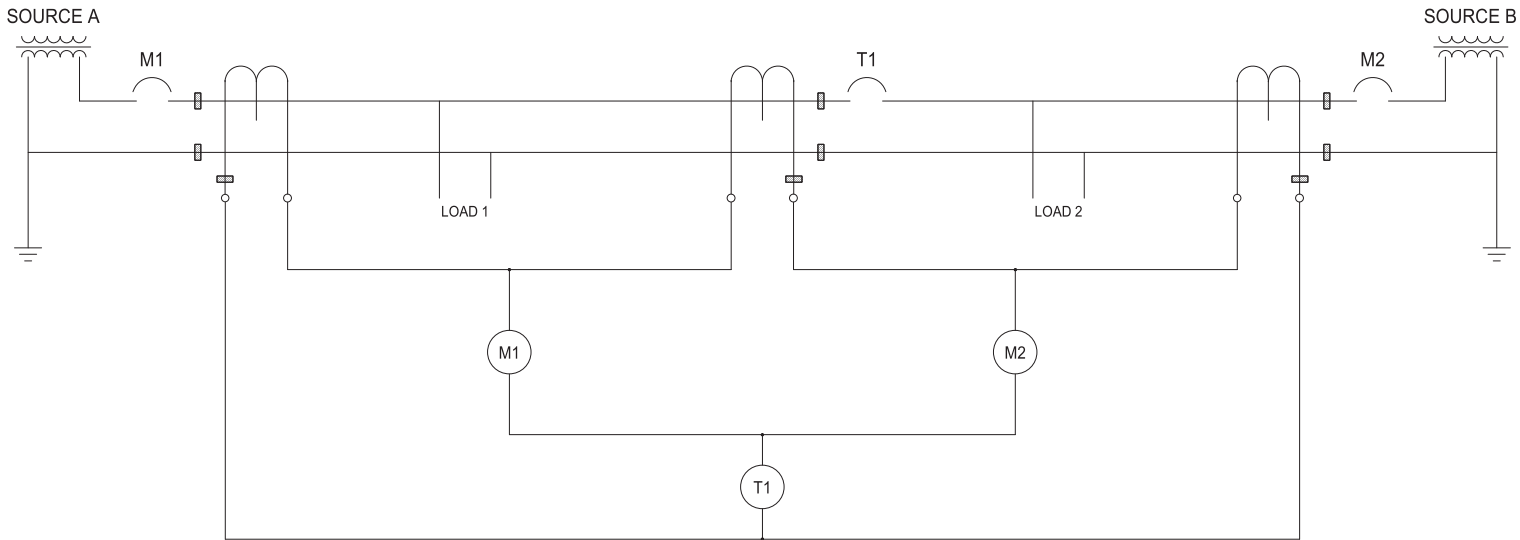
JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
PROJECT ENGR: R. Salgado	DRAWING TYPE: DEVICE LAYOUT INFORMATION
DRAWN BY: RS	
VERIFIED BY:	DRAWING: I51900946-000010 -01-01
PROJECT STATUS: APPROVAL	DATE: 4/3/2026
	PG 01 OF 01 REV

EQUIPMENT COMMUNICATIONS								
COMM CHAIN	SECT NO	CELL NO	DEVICE	BREAKER TRIP UNIT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	MODBUS ADDRESS
1	01	A1	PM8K	-	169.254.50.100	255.255.0.0	NONE	-
1	01	B1	IFE	MICROLOGIC X	169.254.50.101	255.255.0.0	NONE	255
1	02	A1	IFM	MICROLOGIC X	-	-	-	1
1	02	B1	IFM	MICROLOGIC X	-	-	-	2
1	02	C1	IFM	MICROLOGIC X	-	-	-	3
1	02	D1	IFM	MICROLOGIC X	-	-	-	4
1	03	B1	IFM	MICROLOGIC X	-	-	-	5
1	03	D1	IFM	MICROLOGIC X	-	-	-	6
1	05	B1	IFM	MICROLOGIC X	-	-	-	7
1	05	D1	IFM	MICROLOGIC X	-	-	-	8
1	06	A1	IFM	MICROLOGIC X	-	-	-	9
1	06	B1	IFM	MICROLOGIC X	-	-	-	10
1	06	C1	IFM	MICROLOGIC X	-	-	-	11
2	06	D1	IFE	MICROLOGIC X	169.254.50.102	255.255.0.0	NONE	255
2	07	A1	PM8K	-	169.254.50.103	255.255.0.0	NONE	-
2	07	B1	IFM	MICROLOGIC X	-	-	-	1

NOTE: PM8244 Power Meter will be changed to PM5563 Power Meter

Notes:
1. Default characterstics of all IFM Modules: 19200 Baud Rate, Even Parity, 2W Conn Type

REV	DESCRIPTION	BY	DATE	SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
					PROJECT ENGR: R. Salgado	DRAWING TYPE: COMMUNICATIONS TABLE
					DRAWN BY: RS	
					VERIFIED BY:	DRAWING: I51900946-000010 -02-01
					PROJECT STATUS: APPROVAL DATE: 4/3/2026	PG 01 OF 01 REV



NOTES:

1. NO GROUNDING CONDUCTORS CAN BE PLACED ON THE LOAD SIDE OF THE NEUTRAL SENSORS.
2. PHASE SENSORS MAY BE LOCATED ON THE LINE SIDE OF THE MAIN BREAKER.
3. DETAILS OF THE LOAD (BRANCH) BREAKERS ARE NOT SHOWN. LOADS FED BY MORE THAN ONE BRANCH BREAKER OR ADDITIONAL SOURCES (SUCH AS AUTOMATIC TRANSFER SWITCHES) CAN CREATE PARALLEL CURRENT PATHS THAT WILL DEFEAT THIS GROUND FAULT SYSTEM. ALL DOWNSTREAM AUTOMATIC TRANSFER SWITCHES SHOULD BE 4-POLE, NON-OVERLAPPING SWITCHED NEUTRAL TO PREVENT PARALLEL CURRENT PATHS. THE ADDITION OF DOWNSTREAM PARALLEL NEUTRAL PATHS MAY CAUSE NUISANCE TRIPPING RESULTING FROM THE INTRODUCTION OF CIRCULATING CURRENT THROUGH THE GROUND SYSTEM. SQUARE D IS NOT RESPONSIBLE FOR DAMAGES FROM NUISANCE TRIPPING CAUSED BY DOWNSTREAM PARALLEL PATHS.
4. ALL NEUTRAL TO GROUND CONNECTIONS MUST ONLY BE MADE ON THE SOURCE SIDE OF THE SERVICE ENTRANCE NEUTRAL SENSORS.
5. MDGF SENSOR WINDING POLARITIES AND MOUNTING INSTRUCTIONS MUST BE STRICTLY OBSERVED AND WIRING DIAGRAMS FOLLOWED.
6. DO NOT GROUND THE SECONDARY WINDINGS OF ANY SENSORS.
7. LOAD NEUTRAL CABLES MUST BE CONNECTED TO THE NEUTRAL BUS IN THE PROPER SECTION.
8. MECHANICAL RESETTING OF CIRCUIT BREAKERS AND RESTORATION TO NORMAL SERVICE IS REQUIRED AFTER CIRCUIT BREAKERS HAVE TRIPPED OPEN.
9. GROUND FAULT INTERFACE MODULE TO CIRCUIT BREAKER CONNECTIONS REQUIRE A MINIMUM OF 18AWG SHIELDED CABLE OR TWISTED PAIR WITH A MAXIMUM CABLE LENGTH OF 32 FEET. GROUND FAULT INTERFACE MODULE TO CURRENT SENSOR TOTAL INTERCONNECTION CABLE RESISTANCE MUST NOT EXCEED 0.668 OHMS, FOR APPLICATIONS REQUIRING FIELD INTERCONNECTION WIRING, REFER TO SYSTEM WIRING SECTION IN INSTRUCTION BULLETIN 48049-182-03 FOR ADDITIONAL DETAILS.
10. REFER TO 80043-703-01 FOR TEST PROCEDURE INSTRUCTIONS.
11. DO NOT REMOVE THE FACTORY INSTALLED JUMPERS FROM BETWEEN TERMINALS T1 AND T2. FOR ZSI OPTION(S), THE APPROPRIATE Z3, Z4 AND Z5 JUMPER(S) WILL BE REMOVED.
12. VERIFY THE FACTORY INSTALLED JUMPER BETWEEN TERMINALS 13 AND 14 ON THE GROUND FAULT INTERFACE MODULE, REMOVE ONLY IF USING AN EXTERNAL TRIM RESISTOR.

SEQUENCE OF OPERATION - TYPICAL FOR TWO SOURCES AND TIE

THIS "RELAYED" TIE GROUND FAULT PROTECTION SYSTEM IS A DIFFERENTIAL SYSTEM FOR USE IN A TWO SOURCE SYSTEM WHERE BOTH OF THE UTILITY TRANSFORMERS OR STATION SERVICE GENERATORS HAVE GROUNDED "Xo" TERMINALS. THE GROUND FAULT SENSORS (CURRENT TRANSFORMERS) ARE DIFFERENTIALLY CONNECTED TO ENSURE THAT THE SOLID STATE TRIP BREAKERS CAN DIFFERENTIATE BETWEEN CURRENTS AND GROUND FAULT CURRENTS. IF THE SUMMATION OF PHASE CURRENTS FLOWING THROUGH THE SENSORS EXCEED THE TIME AND CURRENT SETTINGS OF THE CIRCUIT BREAKERS, THEN THE SPECIFIED CIRCUIT BREAKER WILL TRIP OPEN.

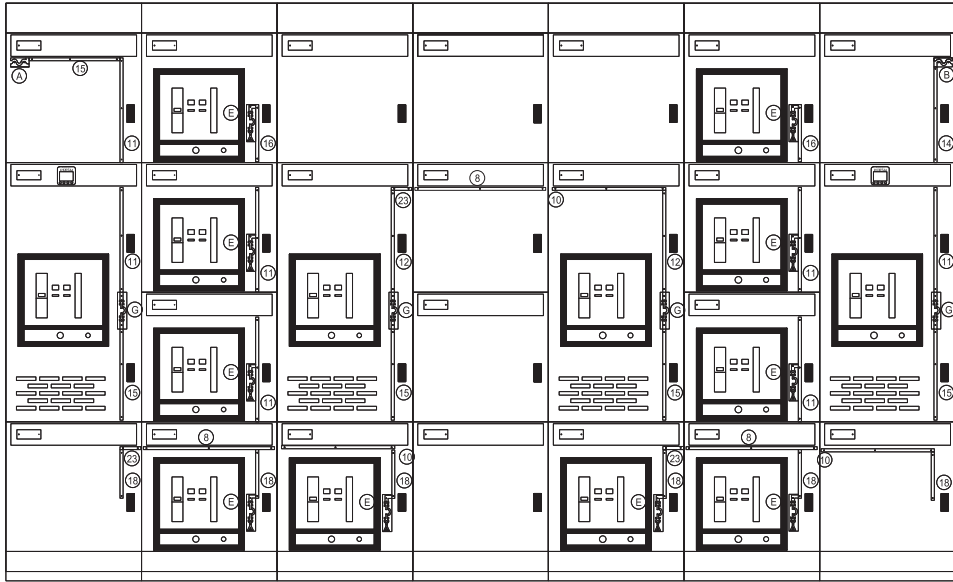
SELECTIVITY:

DURING A GROUND FAULT CONDITION, THIS SYSTEM DETERMINES THE FAULT'S LOCATION AND TRIPS ALL BREAKERS THAT COULD DELIVER POWER ON A CONTINUING BASIS TO THE FAULTED PORTION OF THE POWER SYSTEM.

FOR EXAMPLE, IF THERE IS A FAULT CONDITION ON LOAD 1 BUS, THEN ONLY BREAKERS M1 & T1 WILL BE TRIPPED BY THE GROUND FAULT SYSTEM. THE GROUND FAULT SYSTEM WILL NOT TRIP BREAKER M2, THEREBY MAINTAINING POWER ON LOAD 2 BUS.

MODIFIED DIFFERENTIAL GROUND FAULT TOPOLOGY

REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
					PROJECT ENGR: R. Salgado	DRAWING TYPE: GROUNDFAULT TOPOLOGY
					DRAWN BY: RS	
					VERIFIED BY:	DRAWING: I51900946-000010 -03-01
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026
					PG 01 OF 01 REV	

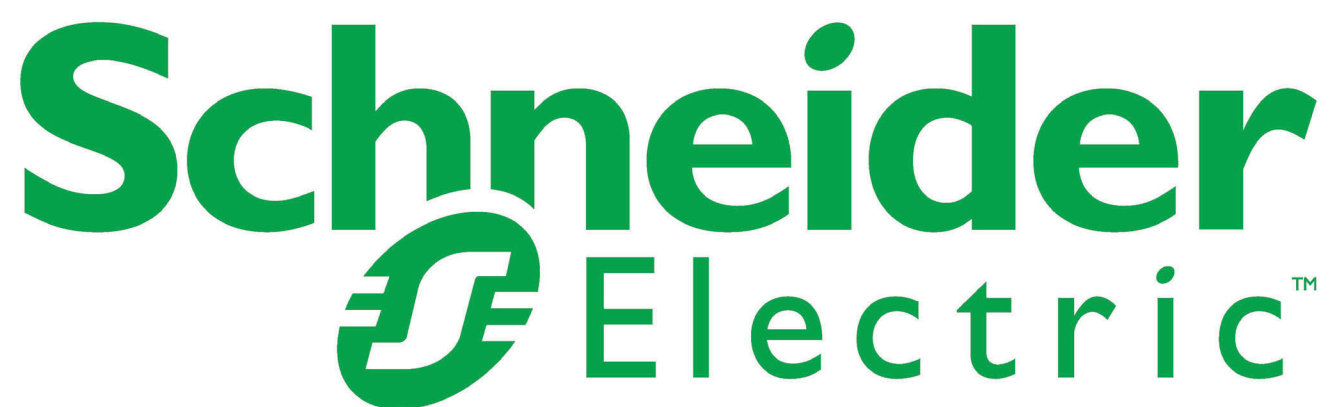


MIMIC BUS STRIPS - BLACK ON GRAY

FIND	PART NUMBER (LEN)	FIND	PART NUMBER (LEN)	FIND	PART NUMBER (LEN)
A	MB-A-BG-XFMRFLT	30	MB-30-BG (13")	14	MB-14-BG (15-1/2")
B	MB-B-BG-XFMRRHT	29	MB-29-BG (6")	13	MB-13-BG (15-7/8")
C	MB-C-BG-CBL	28	MB-28-BG (26-3/4")	12	MB-12-BG (16-1/2")
D	MB-D-BG-BSWY	27	MB-27-BG (22-3/4")	11	MB-11-BG (17")
E	MB-E-BG-FDR-CBL	26	MB-26-BG (1-5/8")	10	MB-10-BG (18-3/8")
F	MB-F-BG-FDRBSWY	25	MB-25-BG (2")	9	MB-9-BG (21")
G	MB-G-BG-MAIN	24	MB-24-BG (2-7/8")	8	MB-8-BG (21-1/4")
H	MB-H-BG-MNBSBTM	23	MB-23-BG (3-3/8")	7	MB-7-BG (29-1/4")
I	MB-I-BG-MNCBBTM	22	MB-22-BG (4")	6	MB-6-BG (31-3/4")
J	MB-J-BG-MNCBTOP	21	MB-21-BG (4-7/8")	5	MB-5-BG (32-3/4")
K	MB-K-BG-MNBSTOP	20	MB-20-BG (7-1/8")	4	MB-4-BG (35-1/4")
L	MB-L-BG-FDCBTOP	19	MB-19-BG (7-5/8")	3	MB-3-BG (36-1/2")
M	MB-M-BG-FDBSTOP	18	MB-18-BG (7-7/8")	2	MB-2-BG (37-1/2")
N	MB-N-BG-STAT-SW	17	MB-17-BG (8-3/8")	1	MB-1-BG (38")
CC	MB-CC-BG (24")	16	MB-16-BG (9-1/4")		
31	MB-31-BG (10-1/2")	15	MB-15-BG (14-3/4")		

NOTE:
MIMIC BUS IS SECURED TO FRONT OF SWITCHGEAR VIA
PRESSURE SENSITIVE ADHESIVE & STAINLESS STEEL SCREWS.

REV	DESCRIPTION	BY	DATE	 SQUARE D by Schneider Electric	JOB NAME: DETROIT DIESEL SUBST	EQUIPMENT DESIGNATION: M1-C
					JOB LOCATION: REDFORD, MI	EQUIPMENT TYPE: PZ4 Switchgear
					PROJECT ENGR: R. Salgado	DRAWING TYPE: MIMIC BUS
					DRAWN BY: RS	DRAWING: N51900946-000010 -01-01
					VERIFIED BY:	
					PROJECT STATUS: APPROVAL	DATE: 4/3/2026
						PG 01 OF 01 REV



LITERATURE



Power-Zone 4

Front Accessible Switchgear



Space has become a scarce commodity in today's growing urban landscapes, yet demand for reliable energy continues to grow. Square D™ Power-Zone™ 4 front-accessible ANSI switchgear by Schneider Electric enables critical facilities to meet layout space challenges without sacrificing reliability.

Power-Zone 4 front accessible switchgear offers the optimum solution for reliable electrical protection and control with an alternative flexible footprint. Customer power connections have been relocated to the front, removing the need for rear access.

Features and Benefits

Flexibility

- 42" depth allows Power-Zone 4 switchgear to be used in more applications
- Suitable to mount against a wall or back to back
- Excellent for e-house applications as it removes the need for outer doors/work platforms resulting in cost savings for the building
- Expand into areas where switchgear previously would not fit
- Wide range of drawout circuit breaker arrangements to optimize footprint

Quality and Reliable Construction

- High short circuit/withstand ratings to support critical facilities
- Compartmentalized, maintenance-friendly switchgear with options for arc flash mitigation
- Captive splice and front accessibility speed installation and maintenance
- Industry leading Masterpact™ drawout, stored-energy circuit breaker
- Standard, repeatable designs are factory wired, programmed, and tested in an ISO9001 facility

Advanced Technology

- Direct Ethernet circuit breaker connectivity for growing data communication needs
- EcoStruxure™ Power solutions from Schneider Electric to meet energy control and monitoring needs at every level
- Ability to retrofit aging infrastructure with latest smart technology



When space
is limited...

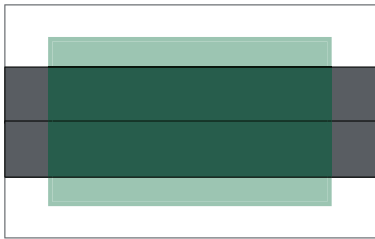
Select Power-Zone 4 switchgear with front-accessible option, which offers maximum footprint flexibility.

schneider-electric.us/PZ4

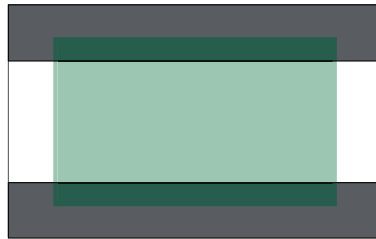
Life Is On

SQUARE D™
by Schneider Electric

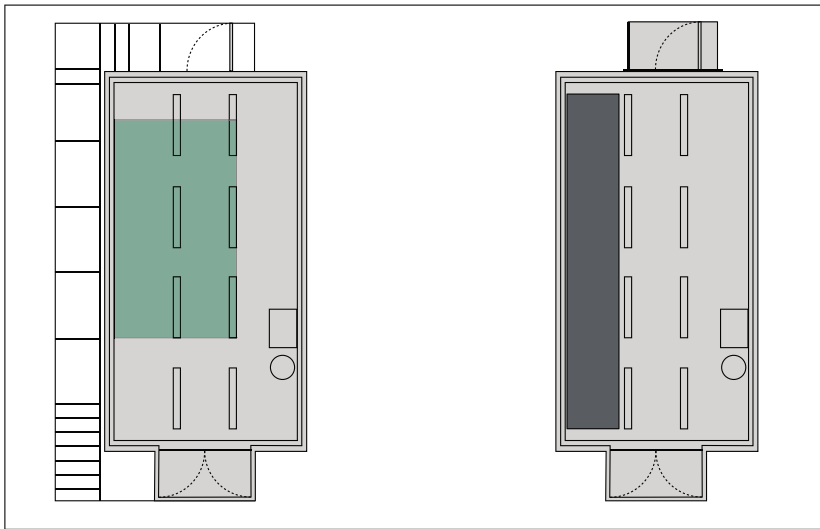
Economics of Front Accessible Switchgear



Back-to-Back Configuration



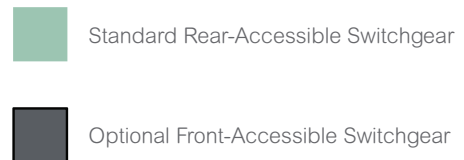
Against the Electrical Room Wall



eHouse or Modular Electrical Enclosure

Flexibility and space savings is what you need when planning a layout with limited space. This can be achieved by using Power-Zone 4 front-accessible switchgear, as shown in this comparison with a traditional line-up, and a line-up with front accessible switchgear:

- Traditional **Rear Accessible** switchgear shown requires 36" aisle ways on all four sides for access and maintenance activities.
- **Front Accessible** switchgear shown requires only front aisleway as all breakers and cable access is in front.
- 37% savings in electrical room square footage was achieved for this typical application.



Technical Features

- ANSI C37.20.1 Rated. Listed to UL1558 & CSA C22.2, No. 31
- Masterpact stored energy, drawout circuit breaker rated per ANSI C37 and Listed to UL1066
- Sections rated to 3200 A horizontal bus, 3200 A vertical bus
- Incoming mains or tie breakers up to 3200 A
- Feeder circuit breakers to 2000 A
- Bus short circuit ratings up to 100 kA, 635 Vac
- Bus short time rating (60 cycle) up to 100 kA, 635 Vac
- Circuit breaker short circuit ratings up to 100kA @ 508 Vac and 85 kA @ 635 Vac.
- Breaker short time ratings up to 85 kA, 635 Vac
- NEMA Type 1 enclosures
- Single or multiple main options
- 42-inch deep footprint
- Main sections with incoming cable provisions are 26 inches wide
- Main/Tie sections combined with feeders begin at 44 inches wide
- Feeder sections begin at 44 inches wide
- Silver plated bus (tin plated or insulated bus is optional)
- SPDs, high resistance grounding resistor/controls, communication networking and PowerLogic power meters/monitors are available
- A circuit breaker floor crane is available.

Typical Layouts



Single Main, Top Incoming Cable 70" W X 42" D total

- 26" W 3200 A Main
- 44" W (3) 800 A Feeder Sections

Double-ended, Main-Tie-Main, 240" W x 42" D total

From Left to Right:

- Section 1 – Single section 3200 A 4W Main with Top Incoming Cable Lugs (26" W)
- Section 2 – 800-1600 A Feeders (44" W)
- Section 3 – 800-2000 A Feeders (52" W)
- Section 4 – Two 1600 A Feeders with 3200 A Tie Breaker below (52" W)
- Section 5 – 3200 A 4W Main with Bottom Incoming Cable Lugs and 800 A feeders above (66" W)



Power-Zone 4 Front Accessible Switchgear

For critical power applications in tight spaces and small places.



For more information, go to:

schneider-electric.us/pz4

Schneider Electric USA, Inc.

800 Federal Street
Andover, MA 01810
888 SQUARED (888-778-2733)

www.schneider-electric.us

September 2018

Document Number 6037HO1801

Life Is On

SQUARE D
by Schneider Electric

Internal Modular SPDs

Square D Internally Mounted Surge Protective Devices

Square D™ brand Surgelogic™ internal modular Surge Protective Devices (SPDs) deliver specification grade performance for service entrance or critical branch panel applications. This multi-phase system provides suppression for all critical modes inside electrical equipment and shorter lead lengths with superior SPD performance.



by **Schneider** Electric

Internal Modular SPDs Features



Internal panel modular Surge Protective Devices (SPDs) provide superior design and service life for a wide variety of commercial, industrial, or institutional applications. Square D brand Surgelogic SPDs offer first-rate performance and surge suppression for demanding service entrance applications or as part of a suppression network. The robust modular construction reduces possible down time and maintenance costs.

Superior Performance

Surgelogic SPDs utilize a high-energy suppression circuit that provides 10 modes of suppression from 100,000 to 480,000 peak Amps of surge current rating per phase. Modular SPDs feature circuitry that provides not only transient surge suppression, but also noise filtration.

Installation

Integral solutions come professionally pre-wired into electrical gear and panels from the factory insuring short lead lengths and high performance. All units are tested at the factory before delivery to their final destination, maintaining Square D brand's high standard of quality. There is also no need for additional enclosures or installation labor costs.

Warranty

Surgelogic internal modular SPDs have a 10-year warranty.

FEATURES	ADVANTAGES	BENEFITS
Integral to electrical gear and panels	SPDs are professionally installed inside electrical gear and panels	Delivers high levels of SPD performance and saves on enclosure and installation expenses
100,000 to 480,000 Amp Capacity (depending on model)	Longer service life and suppression against high-energy lightning strikes	High performance surge suppression even in severe electrical conditions
EMI/RFI Noise Rejection	Increased transient suppression	Improves surge suppression to the equipment
Advanced Diagnostics	Allows for visual indication/testing of the suppressor's functionality	Provides immediate response if suppressor is damaged
Suppression Status Alarms	Allows multiple methods of alarm notification	Provides immediate notification through audible, visual and remote signaling if reduced suppression occurs
Coordinated Fuse Technology	Coordinated fusing allows disconnection methods for thermal and high-current events	Provides premium surge suppression while managing both thermal and high-current end-of-life events

Internal Modular SPDs

Features (continued)

NF Panelboard

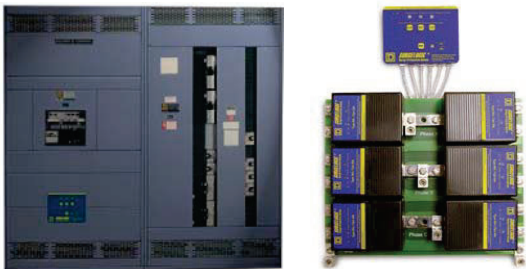


NF panelboards are primarily used for lighting and power distribution up to 600 Amps. These panelboards follow current National Electric Code changes, provide electrical capacity up to 84 circuit breakers, and will allow up to 72 circuits with surge protection installed. NF panels are designed with 200% rated copper neutrals for non-linear loads. (NF max volts 600/347 Vac)

SPD available surge current ratings:

100, 120, 160, 200, 240 kA

QED Switchboard



QED Switchboards are made for use as service entrance equipment or as distribution centers in commercial, institutional, and industrial applications. QEDs are extremely versatile providing front accessible load connections with multiple breaker and fusible switch options. QEDs enable easy access to power monitoring equipment such as products from our Square D brand PowerLogic™ brand. (Max volts 600 Vac, max current 4,000 Amps)

SPD available surge current ratings:

120, 160, 240, 320, 480 kA

Internal SPDs



Performance

Surge Current Rating per Phase	Up to 480kA
Short Circuit Current Rating	200kA
Modes of Protection	6, 10
Fusing	Individually fused MOVs
Thermal Fusing	Yes
Overcurrent Fusing	Yes
Sine Wave Tracking	Yes
EMI/RFI Filtering	Up to -42 dB
Operating Frequency	50/60 Hz

Mechanical Description

Connection Method	#10-#2 AWG Terminals
Mounting Method/Circuit Type	Parallel
Operating Altitude	Sea Level-12,000' (3,658 m)
Storage Temperature	-40° F (-40° C) to 149° F (65° C)
Operating Temp.	-4° F (-20° C) to 149° F (65° C)
LCD Operating Temp.	32° F (0° C) to 149° F (65° C)
Operating Humidity	0 to 95% non-condensing

Diagnostics

Push to test diagnostic switches, red and green status LEDs per phase (internal redundant status LEDs are green), module status LEDs per mode, dry contacts, audible alarm with disable switch, surge counter.

Options

- Remote monitor

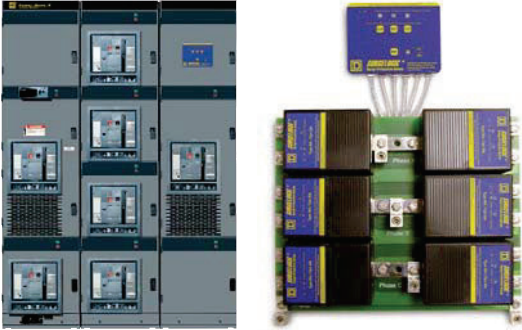
Safety and Performance

Type 2 SPD: cURus per UL 1449 4th Edition and CAN/CSA C22.2 No. 8-M1986.
Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

Type 1 SPD: URus per UL 1449 4th Edition and CAN/CSA C22.2 No. 8-M1986.
Complies with UL 96A 12th Edition Master Label requirements for Lightning Protection Systems.

Internal Modular SPDs Features (continued)

Power-Zone Switchgear

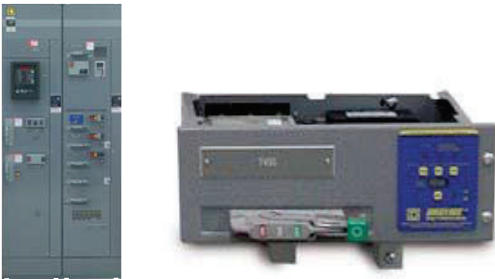


The Square D brand Power-Zone™ 4 low voltage metal-enclosed drawout switchgear is designed to provide superior electrical distribution and power quality management. Power-Zone 4 switchgear is designed to deliver maximum uptime, system selectivity, and ease of maintenance. All of these features are packed into one of the smallest footprints available for low voltage drawout switchgear. (Max volts 600 Vac, max current 5,000 Amps)

SPD available surge current ratings:

120, 160, 240, 320, and 480 kA

Motor Control Center



The feature-rich modular design minimizes space and maximizes ease-of-use and accessibility of motor control devices. The Model 6 MCC has integrated industry-leading components into the smallest and one of the most flexible footprints possible to meet industry's power, control, and automation needs. (Max volts 480 Vac, max current 2,500 Amps)

SPD available surge current ratings: 120, 160, 240 kA

QMB Panelboard



When specifications or electrical codes call for a fusible panelboard, the QMB family offers superior performance and time-saving installation features. The reliability of the QMB panelboard makes it the product of choice for large commercial and industrial applications. (Max volts 600 Vac, max current 400 Amps)

SPD available surge current ratings: 120, 160, 240 kA

Busway



Square D brand I-Line™ Busway is engineered to replace old cable and conduit systems. This next-generation power distribution system is loaded with exceptional features, including a 200% neutral and a 100% isolated ground path. (Max volts 600 Vac, max current 5,000 Amps)

SPD available surge current ratings: 120, 160, 240 kA

Internal Modular SPDs Specifications

05

WYE Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I _n	VPR			
							L-N	L-G	L-L	N-G
120/240V	120kA	6	1 Ø, 3-wire+G	TVS11MA12_	150V	20kA	700V	800V	1200V	700V
208Y/120V ■	120kA	10	3 Ø, Wye, 4-wire+G	TVS21MA12_	150V	20kA	700V	800V	1200V	700V
480Y/277V ▲	120kA	10	3 Ø, Wye, 4-wire+G	TVS41MA12_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	120kA	10	3 Ø, Wye, 4-wire+G	TVS81MA12_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	160kA	6	1 Ø, 3-wire+G	TVS11MA16_	150V	20kA	700V	800V	1200V	700V
208Y/120V ■	160kA	10	3 Ø, Wye, 4-wire+G	TVS21MA16_	150V	20kA	700V	800V	1200V	700V
480Y/277V ▲	160kA	10	3 Ø, Wye, 4-wire+G	TVS41MA16_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	160kA	10	3 Ø, Wye, 4-wire+G	TVS81MA16_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	240kA	6	1 Ø, 3-wire+G	TVS11MA24_	150V	20kA	700V	800V	1200V	700V
208Y/120V ■	240kA	10	3 Ø, Wye, 4-wire+G	TVS21MA24_	150V	20kA	700V	800V	1200V	700V
480Y/277V ▲	240kA	10	3 Ø, Wye, 4-wire+G	TVS41MA24_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	240kA	10	3 Ø, Wye, 4-wire+G	TVS81MA24_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	320kA	6	1 Ø, 3-wire+G	TVS11MA32_	150V	20kA	700V	800V	1200V	700V
208Y/120V ■	320kA	10	3 Ø, Wye, 4-wire+G	TVS21MA32_	150V	20kA	700V	800V	1200V	700V
480Y/277V ▲	320kA	10	3 Ø, Wye, 4-wire+G	TVS41MA32_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	320kA	10	3 Ø, Wye, 4-wire+G	TVS81MA32_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	480kA	6	1 Ø, 3-wire+G	TVS11MA48_	150V	20kA	700V	800V	1200V	700V
208Y/120V ■	480kA	10	3 Ø, Wye, 4-wire+G	TVS21MA48_	150V	20kA	700V	800V	1200V	700V
480Y/277V ▲	480kA	10	3 Ø, Wye, 4-wire+G	TVS41MA48_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	480kA	10	3 Ø, Wye, 4-wire+G	TVS81MA48_	420V	20kA	1500V	1500V	2500V	1500V

■ 208Y/120 series also applies to the following voltage 220Y/127

▲ 480Y/277 series also applies to the following voltages 380Y/220, 400Y/230, and 415Y/240

High-Leg Delta (HLD) Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I _n	VPR						
							L-N	H-N	L-G	H-G	L-L	H-L	N-G
240/120HLD	120kA	10	3 Ø, HLD*, 4-wire+G	TVS31MA12_	150V	20kA	700V	1200V	800V	1200V	1200V	1500V	700V
240/120HLD	160kA	10	3 Ø, HLD*, 4-wire+G	TVS31MA16_	150V	20kA	700V	1200V	800V	1200V	1200V	1500V	700V
240/120HLD	240kA	10	3 Ø, HLD*, 4-wire+G	TVS31MA24_	150V	20kA	700V	1200V	800V	1200V	1200V	1500V	700V
240/120HLD	320kA	10	3 Ø, HLD*, 4-wire+G	TVS31MA32_	150V	20kA	700V	1200V	800V	1200V	1200V	1500V	700V
240/120HLD	480kA	10	3 Ø, HLD*, 4-wire+G	TVS31MA48_	150V	20kA	700V	1200V	800V	1200V	1200V	1500V	700V

Model numbers not recognized as line items in Schneider Electric ordering system until a suffix code is applied

TYPE 2 WYE AND HLD MODEL NUMBER SUFFIX CODES

- P NQ/NF panelboard (Not available in 320 and 480 kA)
- B QED switchboard
- B2 QED series 2 switchboard
- Z PZ3/PZ4 switchgear (Not available in TVS1 or TVS3)
- Q QMB panelboard (Not available in 320 and 480 kA)
- M Motor Control Center (Not available in 320 and 480 kA)

TYPE 1 WYE AND HLD MODEL NUMBER SUFFIX CODES

- P1 NQ/NF panelboard (Not available in 320 and 480 kA)
- B1 QED switchboard
- B21 QED series 2 switchboard
- Z1 PZ3/PZ4 switchgear (Not available in TVS1 or TVS3)
- Q1 QMB panelboard (Not available in 320 and 480 kA)
- M1 Motor Control Center (Not available in 320 and 480 kA)

Internal Modular SPDs

Specifications (continued)

Delta/High-Resistance Ground (HRG) Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I _n	VPR			
							L-N	L-G	L-L	N-G
240V DELTA	100kA	6	3 Ø, Delta, 3-wire+G	TVS61MA10_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	100kA	6	3 Ø, Delta, 3-wire+G	TVS51MA10_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	100kA	6	3 Ø, Delta, 3-wire+G	TVS91MA10_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	120kA	6	3 Ø, Delta, 3-wire+G	TVS61MA12_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	120kA	6	3 Ø, Delta, 3-wire+G	TVS51MA12_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	120kA	6	3 Ø, Delta, 3-wire+G	TVS91MA12_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	160kA	6	3 Ø, Delta, 3-wire+G	TVS61MA16_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	160kA	6	3 Ø, Delta, 3-wire+G	TVS51MA16_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	160kA	6	3 Ø, Delta, 3-wire+G	TVS91MA16_	700V	10kA	N/A	2500V	2500V	N/A
600V DELTA ▲	180kA	6	3 Ø, Delta, 3-wire+G	TVS91MA18_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	200kA	6	3 Ø, Delta, 3-wire+G	TVS61MA20_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	200kA	6	3 Ø, Delta, 3-wire+G	TVS51MA20_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	200kA	6	3 Ø, Delta, 3-wire+G	TVS91MA20_*	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	240kA	6	3 Ø, Delta, 3-wire+G	TVS61MA24_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	240kA	6	3 Ø, Delta, 3-wire+G	TVS51MA24_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	240kA	6	3 Ø, Delta, 3-wire+G	TVS91MA24_*	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	320kA	6	3 Ø, Delta, 3-wire+G	TVS61MA32_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	320kA	6	3 Ø, Delta, 3-wire+G	TVS51MA32_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA ▲	320kA	6	3 Ø, Delta, 3-wire+G	TVS91MA32_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	480kA	6	3 Ø, Delta, 3-wire+G	TVS61MA48_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA ■	480kA	6	3 Ø, Delta, 3-wire+G	TVS51MA48_	640V	20kA	N/A	1800V	2000V	N/A

■ 480V Delta series also applies to the following voltage 480Y/277V HRG

▲ 600V Delta series also applies to the following voltage 600Y/347V HRG

* Note: 200kA and 240kA in 600V DELTA are 6 module systems and will require more installation room

Model numbers not recognized as line items in Schneider Electric ordering system until a suffix code is applied

TYPE 2 DELTA MODEL NUMBER SUFFIX CODES

- B** QED switchboard
B2 QED series 2 switchboard
M Motor Control Center (Not available in 320 and 480 kA for all voltages, 600V DELTA not available also in 200 and 240 kA)
Z PZ3/PZ4 switchgear (Not available in TVS1 or TVS3)

TYPE 1 DELTA MODEL NUMBER SUFFIX CODES

- B1** QED switchboard
B21 QED series 2 switchboard
M1 Motor Control Center (Not available in 320 and 480 kA for all voltages, 600V DELTA not available also in 200 and 240 kA)
Z1 PZ3/PZ4 switchgear (Not available in TVS1 or TVS3)



SPD OPTIONS

Remote Monitor - TVS12RMU

The remote monitor has a single red/green LED status indicator, audible alarm with enable/disable button, and can be wired up to 1,000' feet away. This device connects directly to the dry contact interface of the SPD and will alarm if the SPD enters a fault condition.

Schneider Electric USA, Inc.
 800 Federal Street
 Andover, MA 01810
 Telephone: (978) 794-0800
www.schneider-electric.com/us

Schneider Electric México, S.A. de C.V.
 Calz. J. Rojo Gómez 1121-A
 Col. Gpe. del Moral 09300 México, D.F.
 Tel. 55-5804-5000
www.schneider-electric.com.mx

Schneider Electric Canada, Inc.
 5985 McLaughlin Road
 Mississauga, ON L5R 1B8 Canada
 Tel: 1-800-565-6699
www.schneider-electric.ca

PowerLogic™ PM5000 series Technical Datasheet

The PowerLogic™ PM5000 series power meters are the new benchmark in affordable, precision metering.

The value you want, the precision you need. Compact, affordable power meters with high-end cost capabilities and basic mobile energy management.

Applications

Capable of essential cost management:

- Sub-billing/tenant metering ⁽⁺¹⁾
- Equipment sub-billing
- Energy cost allocation

Also ideal for electrical network management:

- Track real-time power conditions
- Monitor control functions
- Provide basic power quality values
- Detect and capture voltage sag and swell events
- Monitor residual current
- Analyze equipment and network status
- BACnet/IP, EtherNet/IP, and DNP3.0 protocol support



⁽⁺¹⁾ Subjected to local regulations.

The solution for

Markets that can benefit from a solution that includes PowerLogic™ PM5000 series meters:

- Buildings
- Industry
- Healthcare
- Data Center and networks
- Infrastructure

Benefits

System integrators' benefit

- Ease of integration
- Ease of setup
- Cost effectiveness

Panel builders' benefit

- Ease of installation
- Cost effectiveness
- Aesthetically pleasing
- Simplified ordering
- Low Voltage DC control power option
- Analog inputs options

End users' benefit

- Ease of use
- Precision metering & sub-billing ⁽⁺²⁾
- Billing flexibility
- Comprehensive, consistent and superior performance
- Maximize uptime, eliminate faults, and enhance safety
- Cybersecurity features

Competitive advantages

- Easy to install and operate
- Easy for circuit breaker monitoring and control
- WAGES monitoring
- Data logging up to 16 parameters
- Power quality analysis up to 63rd harmonics
- Load management combined with alarm and timestamping
- High performance and accuracy
- Residual Current Monitoring (RCM) in PM56xx⁽⁺⁴⁾ and PM57xx⁽⁺⁴⁾
- Voltage sag and swell detection with waveform capture
- MID ready compliance for legal billing application
- Onboard BACnet/IP, EtherNet/IP, and DNP3.0 protocol support
- PM5310R ⁽⁺³⁾ and PM5320R ⁽⁺³⁾ are enabled to connect with LVCT for faster installations

⁽⁺²⁾ Subjected to local regulations.

⁽⁺³⁾ PM5310R and PM5320R must be used with Schneider Electric's "Quick Click" 3-in-1 LVCTs.

⁽⁺⁴⁾ PM5660, PM5661, PM5760, PM5761 must be used with Toroids.

Power management solutions

Schneider Electric provides innovative power management solutions to increase your energy efficiency and cost savings, maximize electrical network reliability and availability, and optimize electrical asset performance.

Conformity of standards

- BS/EN/IEC 61557-12:2018/AMD1:2021
- BS/EN/IEC 62052-11:2020 edition 2
- IEC 62052-31:2015
- BS/EN/IEC 62053-22:2020 edition 2
- BS/EN/IEC 62053-23:2020 edition 2
- IEEE 802.3
- EN 50470-1:2006
- EN 50470-3:2006
- CE and UKCA as per IEC/BS 61010-1 edition 3
- cULus as per UL 61010-1 edition 3
- BS/EN/IEC 61010-2-30:2017
- BS/EN/IEC 61326-1: edition 3
- FCC part 15 Class B
- EN 55022 Class B
- BACnet/IP - BTL listed (B-ASC)
- EtherNet/IP - ODVA certified
- ANSI C12.1-2008 (PM55xx)
- ANSI C12.20 Class 0.2 & 0.5
- Align with cyber security guidelines as per IEC 62443
- Type A as per IEC 62020 for RCM

Meets IEC 61557-12 PMD/[SD|SS]/K70/0.5 for PM5100 and PM5300

Meets IEC 61557-12 PMD/[SD|SS]/K70/0.2 for PM5500, PM5600, PM5700

- Legal billing compliance
 - MID compliance is compulsory for billing applications across Europe
 - In addition to billing applications, for facility managers responsible for energy cost
 - MID means same level of quality as a billing meter

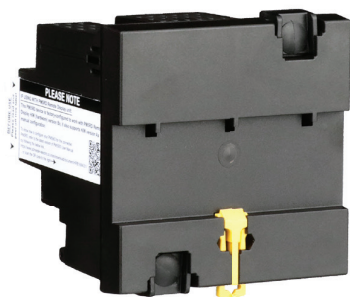
MID

Certified according to MID Directive, Annex "B" + Annex "D" for legal metrology relevant to active electrical energy meters (see Annex MI-003 of MID). Can be used for fiscal (legal) metrology.

MID ready compliance, EN 50470-1/3 – Class C

PM5000 series

PB118062



PowerLogic™ PM5563 meter

PB118063



PowerLogic™ PM5563 remote display front ISO

PB118064



PowerLogic™ PM5563 remote display rear ISO

PowerLogic™ PM5100, PM5300 and PM5500 series

The PowerLogic™ PM5000 power meter is the ideal fit for cost management applications. Designed for use in both energy management systems and building management systems, it provides the measurement capabilities needed to allocate energy usage, perform tenant metering and sub-billing, pin-point energy savings, optimize equipment efficiency and utilization, and perform a high level assessment of the power quality of the electrical network.

In a single 96 x 96 mm unit, with a graphical display, (plus optional remote display) all three phases, neutral and ground can be monitored simultaneously. The bright, anti-glare display features large characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles. Easy to understand menus, text in 8 selectable languages, icons and graphics create a friendly environment to learn about your electrical network. Ethernet gateway and enhanced cyber security. These are highly accurate devices with global billing certifications.

Applications

- **Cost management:** Cost saving opportunities become clear once you understand how and when your facility uses electricity. The PowerLogic™ PM5000 series meters are ideal for:
 - Sub-billing / tenant metering: Allows a landlord, property management firm, condominium association, homeowners association, or other multi-tenant property to bill tenants for individual measured utility (electricity) usage depending on the local regulations. MID approved meters for billing applications across Europe.
 - Cost allocation: Allocate energy costs between different departments (HVAC, indoor and outdoor lighting, refrigeration, etc.), different parts of an industrial process or different cost centres. Cost allocation systems can help you save money by making changes to your operation, better maintaining your equipment, taking advantage of pricing fluctuations, and managing your demand.
- **Network management:** Improving reliability of the electrical network is key for success in any business. Monitoring values such as voltage levels, harmonics distortions, voltage unbalance, residual current, voltage sag and swell will help you to ensure proper operation and maintenance of your electrical network and equipment. PowerLogic™ PM5000 series meters are the perfect tool for:
 - Basic Power Quality monitoring: Power quality phenomena can cause undesirable effects such as heating in transformers, capacitors, motors, generators and misoperation of electronic equipment and protection devices.
 - Min/ Max monitoring (with timestamp): Understanding when electrical parameters, such as voltage, current and power demand, reach maximum and minimum values will give you the insight to correctly maintain your electrical network and assure equipment will not be damaged.
 - Alarming: alarms help you to be aware of any abnormal behaviour on the electrical network in the moment it happens.
 - WAGES monitoring: take advantage of the input metering on PM5000 meters to integrate measurements from third party devices such as water, air, gas, electricity or steam meters.
 - Residual current monitoring: measures leakage current flowing in TN & TT network system.
 - Voltage sags and swells: measures and captures wave form in the event of voltage sags and swells in the network.
- **Main characteristics**
 - Easy to install
 - Mounts using two clips, in standard cut out for DIN 96 x 96 mm, no tools required. Compact meter with 72 mm (77 mm for PM5500) depth connectable up to 690 V L-L without voltage transformers for installations compliant with category III. Optional remote display (PM5563). Ethernet gateway functionality via RS-485 port.
 - Easy to operate
 - Intuitive navigation with self-guided, language selectable menus, six lines, four concurrent values. Two LEDs on the meter face help the user confirm normal operation with a green LED - heartbeat/communications indicator, and the amber LED - customizable either for alarms or energy pulse outputs. Onboard web pages (PM5500) show real-time and logged information, and verify communications.
 - Easy circuit breaker monitoring and control
 - The PM5300 provides two relay outputs (high performance Form A type) with capability to command most of the circuit breaker coils directly. For Digital Inputs, monitored switches can be wired directly to the meter without external power supply by using wetting output voltage.
 - PM5500 series have 4 status inputs (digital) and 2 digital output (solid state) to use for WAGES monitoring, control and alarm annunciation.

Accurate energy measurement for precise cost allocation:

	PM5100	PM5300	PM5500	PM5600	PM5700
IEC 62053-22 (Active Energy)	Class 0.5S	Class 0.5S	Class 0.2S	Class 0.2S	Class 0.2S
IEC 62053-23 (Reactive Energy)	Class 1.0	Class 1.0	Class 1.0	Class 1.0	Class 1.0

PM5000 series

PB111777



PowerLogic™ PM5500 meter

PB111772



PowerLogic™ PM5300 meter

PB111768



PowerLogic™ PM5100 meter

Native multi-protocol support

The PM55/PM56/PM5700 is now easier than ever to integrate into new and existing BMS systems. With native BACnet/IP protocol support, meters can simultaneously communicate via BACnet and Modbus in applications where multiple software systems are used (building management and energy management systems).

The PM55/PM56/PM5700 series has been tested and certified in accordance with BACnet Testing Laboratories (BTL) requirements and Ethernet IP protocol as per ODVA requirements.

- PM55/PM56/PM5700 Direct metering of neutral current
 - The PM55/PM56/PM5700 has a fourth CT for measuring neutral current. In demanding IT applications, where loads are non-linear (i.e. switching power supplies on computers/servers), measuring neutral current is essential to avoid overload and resulting outage.
 - Power Quality analysis
 - The PM5000 offers Total Harmonic Distortion (THD/thd), Total Demand
 - Distortion (TDD) measurements and individual harmonics (odd) magnitudes and angles for voltage and current:

	PM5100	PM5300	PM55/56/5700
Individual Harmonics	magnitudes up to 15 th	magnitudes up to 31 st	magnitudes & angles up to 63 rd

- These types of power quality parameters help to identify the source of harmonics that can harm transformers, capacitors, generators, motors and electronic equipment.
- Load management
 - Peak demands with time stamping are provided. Predicted demand values can be used in combination with alarms for basic load shedding applications.
- Alarming with time stamping
 - A different combination of set point driven alarms and digital alarms with 1s time stamping are available in the PM5000 family:

	PM5100	PM5300	PM55/56/5700
Set point driven alarms	29	29	29 or 33*
Unary	4	4	4
Digital	–	2	4 or 2
Boolean / Logic	–	–	10
Custom defined	–	–	5

*Applicable in specific meter models. 2 alarms for disturbance (Sag/ Swell).

- Alarms can be visualized as Active (the ones that have picked up and did not drop out yet) or Historical (the ones that happened in the past). Alarms can be programmed and combined to trigger digital outputs and mechanical relays (PM5300).
- The PM5000 series keeps an alarm log with the active and historical alarms with date and time stamping. SMTP protocol for receiving alarm conditions via email and text. SNTP protocol for date/time network synchronization.
- Load timer
 - A load timer can be set to count load running hours based on a minimum current withdraw, adjustable to monitor and advise maintenance requirements on the load.
- High Performance and accuracy
 - IEC 61557-12 Performance measuring and monitoring devices (PMD). Defines the performance expectation based on classes. It defines the allowable error in the class for real and reactive power and energy, frequency, current, voltage, power factor, voltage unbalance, voltage and current harmonics (odds), voltage THD, current THD, as well as ratings for temperature, relative humidity, altitude, start-up current and safety. It makes compliant meters readings comparable - they will measure the same values when connected to the same load.

PM5000 series

PM5000 series feature selection

	PM5100		PM5300					
	PM5100	PM5110	PM5310	PM5310R ⁽⁺⁵⁾	PM5320	PM5320R ⁽⁺⁵⁾	PM5330	PM5340
Installation								
Fast installation, panel mount with integrated display	■	■	■	■	■	■	■	■
Fast installation, DIN rail mountable	–	–	–	–	–	–	–	–
Accuracy								
Class	CL 0.5S	CL 0.5S	CL 0.5S	CL 0.5S	CL 0.5S	CL 0.5S	CL 0.5S	CL 0.5S
Display								
Backlit LCD, multilingual, bar graphs, 6 lines, 4 concurrent values	■	■	■	■	■	■	■	■
Power and energy metering								
3-ph voltage, current, power, demand, energy, frequency, power factor	■	■	■	■	■	■	■	■
Multi-tariff	–	–	4	4	4	4	4	4
MID ready compliance, EN50470-1/3, Annex B & Annex D Class C	–	PM5111	–	–	–	–	PM5331	PM5341
Power quality analysis								
THD, thd, TDD	■	■	■	■	■	■	■	■
Harmonics, individual (odd) up to	15th	15th	31st	31st	31st	31st	31st	31st
Waveform capture & sag/swell detection	–	–	–	–	–	–	–	–
I/Os and relays								
Digital inputs/ Digital output	1DO	1DO	2DI/2DO	2DI/2DO	2DI/2DO	2DI/2DO	2DI/2DO	2DI/2DO
Relays	–	–	–	–	–	–	2	2
Analog inputs	–	–	–	–	–	–	–	–
Residual Current inputs	–	–	–	–	–	–	–	–
Alarms and control								
Alarms	33	33	35	35	35	35	35	35
Set point response time, seconds	1	1	1	1	1	1	1	1
Single and multi-condition alarms	–	–	■	■	■	■	■	■
Boolean alarm logic	–	–	–	–	–	–	–	–
Memory for data logging	–	–	256KB	256KB	256KB	256KB	256KB	256KB
Communications								
Serial ports with modbus protocol	–	1	1	1	–	–	1	–
Ethernet port with Modbus TCP protocol	–	–	–	–	1	1	–	1
BACnet/IP protocol	–	–	–	–	■	■	–	■
EtherNet/IP protocol	–	–	–	–	–	–	–	–
DNP3.0 over Ethernet	–	–	–	–	–	–	–	–
Onboard web server with web pages	–	–	–	–	–	–	–	–
Serial to Ethernet gateway	–	–	–	–	–	–	–	–
Ref. number followed with METSE*	PM5100	PM5110	PM5310	PM5310R ⁽⁺⁵⁾	PM5320	PM5320R ⁽⁺⁵⁾	PM5330	PM5340

*See table below for complete commercial reference numbers

⁽⁺⁵⁾ PM5310R and PM5320R must be used with Schneider Electric's "Quick Click" 3-in-1 LVCTs



PM5000 series

PM5000 series feature selection

	PM5500					PM5600		PM5700
	PM5560	PM5563	PM5563RD	PM5570	PM5580	PM5650	PM5660	PM5760
Installation								
Fast installation, panel mount with integrated display	■	–	–	■	■	■	■	■
Fast installation, DIN rail mountable	–	■	■	–	–	–	–	–
Accuracy								
Class	CL 0.2S	CL 0.2S	CL 0.2S	CL 0.2S	CL 0.2S	CL 0.2S	CL 0.2S	CL 0.2S
Display								
Backlit LCD, multilingual, bar graphs, 6 lines, 4 concurrent values	■	–	■	■	■	■	■	■
Power and energy metering								
3-ph voltage, current, power, demand, energy, frequency, power factor	■	■	■	■	■	■	■	■
Multi-tariff	8	8	8	8	8	8	8	8
MID ready compliance, EN50470-1/3, Annex B & Annex D Class C	PM5561	–	–	–	–	–	PM5661	PM5761
Power quality analysis								
THD, thd, TDD	■	■	■	■	■	■	■	■
Harmonics, individual (odd) up to	63 rd	63 rd	63 rd	63 rd	63 rd	63 rd	63 rd	63 rd
Waveform capture & sag/swell detection	–	–	–	–	–	8 cycles @ 128 samples/cycle	–	8 cycles @ 128 samples/cycle
I/Os and relays								
Digital inputs/ solid state Digital output	4DI/2DO	4DI/2DO	4DI/2DO	2DI/2DO	4DI/2DO	4DI/2DO	2DI/2DO	2DI/2DO
Relays	–	–	–	–	–	–	–	–
Analog inputs	–	–	–	2	–	–	–	–
Residual Current inputs	–	–	–	–	–	–	2	2
Alarms and control								
Alarms	52	52	52	50	52	54	54	56
Set point response time, seconds	1	1	1	1	1	1	1	1
Single and multi-condition alarms	■	■	■	■	■	■	■	■
Boolean alarm logic	■	■	■	■	■	■	■	■
Memory for data logging	1.1 MB	1.1 MB	1.1 MB	1.1 MB	1.1 MB	1.1 MB	1.1 MB	1.1 MB
Communications								
Serial ports with modbus protocol	1	1	1	1	1	1	1	1
Ethernet port with Modbus TCP protocol	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾	2 ⁽⁺⁶⁾
BACnet/IP protocol	■	■	■	■	■	■	■	■
EtherNet/IP protocol	■	■	■	■	■	■	■	■
DNP3.0 over Ethernet	■	■	■	■	■	■	■	■
Onboard web server with web pages	■	■	■	■	■	■	■	■
Serial to Ethernet gateway	■	■	■	■	■	■	■	■
Ref. numbers with METSE*	PM5560	PM5563	PM5563RD	PM5570	PM5580	PM5650	PM5660	PM5760

*See table below for complete commercial reference numbers

⁽⁺⁶⁾ 2 Ethernet ports for daisy chain, one IP address.



PM5000 series

PM5000 technical specifications

		PM5100	PM5300	PM5500	PM5600	PM5700
Use on LV and MV systems				■		
Basic metering with THD and min/max readings				■		
Instantaneous rms values						
Current	Average, per phase, neutral and ground (PM5500)			■		
Voltage	Average, per phase L–L and L–N			■		
Frequency	Any available phase			■		
Real, reactive, and apparent power	Total and per phase			Signed, Four Quadrant		
True Power Factor	Average and per phase			Signed, Four Quadrant		
Displacement PF	Average and per phase			Signed, Four Quadrant		
% Unbalanced I, V L–N, V L–L				■		
Direct monitoring of neutral current		–		■	■	■
Energy values						
Accumulated Active, Reactive and Apparent Energy		Received/Delivered; Net and absolute; Time Counters				
Demand value						
Current average		Present, Last, Predicted, Peak, and Peak Date Time				
Active power		Present, Last, Predicted, Peak, and Peak Date Time				
Reactive power		Present, Last, Predicted, Peak, and Peak Date Time				
Apparent power		Present, Last, Predicted, Peak, and Peak Date Time				
Peak demand with timestamping D/T for current and three powers				■		
Demand calculation	Sliding, fixed and rolling block, thermal methods			■		
Synchronisation of the measurement window to input, communication command or internal clock				■		
Settable Demand intervals				■		
Demand synchronization with pulse input		–			■	
Other measurements						
I/O timer				■		
Operating timer				■		
Load timer				■		
Alarm counters and alarm logs				■		
Power quality measurements						
THD, thd (Total Harmonic Distortion) I, V L–N, V L–L		I, V L–N, V L–L				
TDD (Total Demand Distortion)				■		
Individual harmonics (odds)		15 th (PM5110)	31 st		63 rd	
Neutral Current metering with ground current calculation		–	–		■	
Waveform capture and sag/swell detection		–	–	–	8 cycles @ 128 samples/cycle	
Data recording						
Min/max of instantaneous values, plus phase identification ⁽⁺⁷⁾				■		
Alarms with 1s timestamping ⁽⁺⁷⁾				■		
Data logging			2 fixed parameters kWh and kVAh with configurable interval & duration (e.g. 2 parameters for minimum 60 days at 15-minute intervals)	Up to 14 selectable parameters with configurable interval and duration (e.g. 6 parameters for minimum 90 days at 15-minute intervals)		
Min/max log		■	■		■	
Maintenance, alarm and event logs			■		■	
Customisable data logs			–		■	
RTC with battery back up		3 years (when meter is in Power OFF condition)				
Display resolution		5 digits for Energy and other parameters with auto scaling				
Preset Energy and Energy scaling		Available in selected references				

⁽⁺⁷⁾ Stored in non-volatile memory



PM5000 series

PM5000 technical specifications

		PM5100	PM5300	PM5500	PM5600	PM5700
Inputs / Outputs / Mechanical Relays						
Digital inputs		–	2	4 in PM5560, PM5561, PM5562, PM5563, PM5580, PM5650 2 in PM5570, PM5660, PM5661, PM5760, PM5761		
Digital outputs		1 (kWh only)	2	2 (Solid state)		
Form A Relay outputs		–	2	–		
Analog inputs		–	–	2 for PM5570	–	–
Residual Current inputs		–	–		2 for PM5660	2 for PM5760
Timestamp resolution in seconds		1	1	1	1	1
Whetting source		–	24 V DC, 8 mA	–	–	–
Type of measurement: True rms on three-phase (3P, 3P + N)		64 samples per cycle		128 samples per cycle		
Measurement accuracy	IEC 61557-12	PMD/[SD SS]/K70/0.5		PMD/[SD SS]/K70/0.2		
	Active Energy	Class 0.5S as per IEC 62053-22/ Class 0.5 as per IEC 61557-12/ ± 0.5%		Class 0.2S as per IEC 62053-22/ Class 0.2 as per IEC 61557-12/ ± 0.2%		
	Reactive Energy	Class 2 as per IEC 62053-23/ Class 1.0 as per IEC 61557-12/ ± 1.0%		Class 2 as per IEC 62053-23/ Class 1.0 as per IEC 61557-12/ ± 1.0%		
	Active Power	Class 0.5 as per IEC 61557-12/ ± 0.5%		Class 0.2 as per IEC 61557-12/ ± 0.2%		
	Apparent Power	Class 0.5 as per IEC 61557-12/ ± 0.5%		Class 0.5 as per IEC 61557-12/ ± 0.5%		
	Reactive Power	Class 1.0 as per IEC 61557-12/ ± 1.0%		Class 1.0 as per IEC 61557-12/ ± 1.0%		
	Current, Phase	Class 0.5 as per IEC 61557-12/ ±0.5 %		Class 0.2 as per IEC 61557-12/ ±0.15 %		
	Voltage, L-N	Class 0.5 as per IEC 61557-12/ ± 0.5 %		Class 0.2 as per IEC 61557-12/ ± 0.1 %		
	Frequency	Class 0.05 as per IEC 61557-12/ ±0.05 %		Class 0.05 as per IEC 61557-12/ ±0.05 %		
	Power Factor	Class 0.5 as per IEC 61557-12/ ±0.005 count		Class 0.5 as per IEC 61557-12/ ±0.005 count		
	Voltage unbalance	Class 5/ ±5%		Class 2/ ±2%		
	Voltage harmonics	Class 5/ ±5%		Class 2/ ±2%		
	Voltage THD Class	Class 5/ ±5%		Class 2/ ±2%		
	Current harmonics	Class 5/ ±5%		Class 2/ ±2%		
	Current THD Class	Class 5/ ±5%		Class 2/ ±2%		
MID Directive EN50470-1, EN50470-3	Annex B and Annex D (Optional model references) Class C					
Input-voltage (up to 1.0 MV AC max, with voltage transformer)	Nominal Measured Voltage range	20 V L-N / 35 V L-L to 400 V L-N /690 V L-L absolute range 35 V L-L to 760 V L-L		20 V L-N / 20 V L-L to 400 V L-N /690 V L-L absolute range 20 V L-L to 828 V L-L		
	Impedance	5 MΩ				
	Frequency nominal	50 or 60 Hz ±5 %		50 or 60 Hz ±10 %		
Input-current (configurable for 1 or 5 A secondary CTs)	I nominal	5 A				–
	Measured Amps with over range	Starting current: 5 mA Operating range: 50 mA to 8.5 A		Starting current: 5 mA Operating range: 50 mA to 10 A (with Crest Factor)		
	Withstand	Continuous 20 A, 10 s/hr 50 A, 1 s/hr 500 A				
	Impedance	< 0.3 mΩ				
	Frequency nominal	50 or 60 Hz ±5 %		50 or 60 Hz ±10 %		
	Burden	<0.026 VA at 8.5 A				
AC control power	Operating range	100 - 277 V AC L-N / 415 V L-L +/-10 % CAT III 300V class per IEC 61010		100-480 V AC ±10 % CAT III 600V class per IEC 61010		
	Burden	<5 W,11 VA at 415V L-L		<5W/16.0 VA at 480 V AC		
	Frequency	45 to 65 Hz				
	Ride through time at maximum burden	80 mS typical at 120V AC 100 mS typical at 230 V AC 100 mS typical at 415 V AC		35 ms typical at 120 V L-N 129 ms typical at 230 V L-N		
DC control power	Operating range	125–250 V DC ±20 % (100 to 300 V DC)				
	Burden	<4 W at 250 V DC		typical 3.1 W at 125 V DC, max. 5 W		
	Ride-through time	50 mS typical at 125 V DC and maximum burden				
LV DC control power	20-60 V DC ±10 % CAT III Burden 4.1 W max.	–	–	■ PM5580	–	–



PM5000 series

PM5000 technical specifications

			PM5100	PM5300	PM5500	PM5600	PM5700	
Outputs	Relay outputs	Max output frequency	–	0.5 Hz maximum (1 s ON / 1 s OFF - min times)	–	–	–	
		Switching current, at resistive load	–	250 V AC at 8.0 Amps, 25 k cycles 30 V DC at 2.0 Amps, 75 k cycles 30 V DC at 5.0 Amps, 12.5 k cycles	–	–	–	
		Isolation	–	2.5 kV rms	–	–	–	
	Digital outputs	Max load voltage	40 V DC			40 V AC / 60 V DC (PM5500 and PM 5650) 30 V AC / 40 V DC (PM5660, PM5661, PM5760, PM5761)		
		Max load current	20 mA			125 mA (Solid state)		
		On Resistance	50 Ω max			8 Ω		
		Meter constant	from 1 to 9,999,999 pulses per k_h (kWh, kVAh, kVARh)					
		Pulse width for Digital Output	50 % duty cycle					
		Pulse frequency for Digital Output	25 Hz max.					
		Leakage current	0.3 micro Amps			1 micro Amps		
	Isolation	5 kV rms			2.5 kV rms for 60 s			
	Optical outputs	Pulse width (LED)	200 ms					
		Pulse frequency	2.5 kHz. max			2.5 kHz. max		
		Meter constant	from 1 to 9,999,999 pulses per k_h (kWh, kVAh, kVARh)					
Status Inputs	ON Voltage		–	18.5 to 36 V DC	15 to 30 V AC / 15 to 60 V DC max			
	OFF Voltage		–	0 to 4 V DC	0 to 6 V AC / 0 to 6 V DC			
	Input Resistance		–	110 k Ω	100 k Ω			
	Maximum Frequency		–	2 Hz (T ON min = T OFF min = 250 ms)	25 Hz (T ON min = T OFF min = 20 ms)			
	Response Time		–	20 ms	10 ms			
	Opto Isolation		–	5 kV rms	2.5 kV rms for 60 s			
	Whetting output		–	24 V DC/ 8 mA max	-			
	Input Burden		–	2 mA @24V DC	2 mA @ 24 V AC/DC 2.5 mA @ 60 V AC/DC			
Analog inputs (PM5570)		–			4 - 20 mA DC (nominal), Accuracy: 1% of full-scale reading, Impedance < 20 Ω, Operating voltage: 24 V DC max		–	
Residual Current inputs (PM5660, PM5661, PM5760, PM5761) Type A as per IEC 62020		–			5 uA to 1200 uA (nominal), 1500 uA max (continuous), Input type: AC 45 to 65 Hz, Burden: 150 Ω, Default toroid: 1000 turns			
Mechanical characteristics								
Product weight		380 g	430 g	450 g	450 g	450 g		
IP degree of protection (IEC 60529)		IP54 front display, IP30 rear side (IP65 front side with Optional accessory kit METSEIP65OP96X96FF)						
Dimensions W x H x D [protrusion from cabinet]		96 x 96 x 72 mm (77 mm for PM5500) (depth of meter from housing mounting flange) [13 mm]						
Mounting position		Vertical						
Panel thickness		6 mm maximum						
LVCT ^(*) inputs for PM5310R and PM5320R - Nominal voltage of 0.333V								
Measurement range		-	0.00333V - 0.4V	-	-	-		

^(*) PM5310R and PM5320R must be used with Schneider Electric's "Quick Click" 3-in-1 LVCTs



PM5000 series

PM5000 technical specifications

		PM5100	PM5300	PM5500	PM5600	PM5700
Environmental characteristics						
Operating temperature	Operating temperature	-25 °C to 70 °C				
	Display (reduced display performance at -25 °C)	-25 °C to 70 °C				
Storage temperature		-40 °C to 85 °C				
Humidity range		5 to 95 % RH at 50 °C (non-condensing)				
Pollution degree		2				
Altitude		2000 m CAT III / 3000 m CAT II		3000 m max. CAT III		
Mission profile / Life span		>15 years				
Protective treatment		Conformal coating				
Electromagnetic compatibility						
Harmonic current emissions		–	–	IEC 61000-3-2		
Flicker emissions		–	–	IEC 61000-3-3		
Electrostatic discharge		IEC 61000-4-2				
Immunity to radiated fields		IEC 61000-4-3				
Immunity to fast transients		IEC 61000-4-4				
Immunity to surge		IEC 61000-4-5				
Conducted immunity 150 kHz to 80 MHz		IEC 61000-4-6				
Immunity to magnetic fields		IEC 61000-4-8				
Immunity to voltage dips		IEC 61000-4-11				
Immunity to damped oscillatory waves		–	–	IEC 61000-4-12		
Radiated and conducted emissions		FCC part 15, EN 55022 Class B				
Safety						
Europe		CE, as per IEC 61010-1 Ed. 3, IEC 62052-11 & IEC 61557-12				
U.S. and Canada		cULus as per UL 61010-1 (Edition 3)				
Measurement category (Voltage & Current inputs)		CAT III up to 400 V L-N / 690 V L-L				
Dielectric		As per IEC/UL 61010-1 (Edition 3)				
Protective Class		II, Double insulated for user accessible parts				
Communication						
RS-485 port Modbus RTU, Modbus ASCII (7 or 8 bit), JBUS		2-Wire, 9600,19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity Odd or Even, 2 stop bits if None; (Optional in PM51x and PM53x)				
Ethernet port: 10/100 Mbps; Modbus TCP/IP		–	1 Optional	2 (daisy chain only, 1 IP address)		
Native Ethernet/IP & DNP3.0 over Ethernet		–	–	Yes	Yes	Yes
FTP / FTPS		–	–	Yes	Yes	Yes
SNMP, SNMP, SMTP		–	–	Yes	Yes	Yes
HTTPS		–	–	Yes	Yes	Yes
Firmware and language file update		Meter firmware update via the communication ports				
Isolation		2.5 kVrms, double insulated				
Human machine interface						
Display type		Monochrome Graphics LCD				
Resolution		128 x 128 pixels				
Backlight		White LED				
Viewable area (W x H)		67 x 62.5 mm				
Keypad		4-button				
Indicator Heartbeat / Communication activity		Green LED				
Energy pulse output / Active alarm (configurable)		Optical, amber LED				
Wavelength		590 to 635 nm				
Maximum pulse rate		2.5 kHz				



PM5000 series

Comm. ref numbers	Description
METSEPM5100	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 15th harmonic, 1DO
METSEPM5110	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 15th harmonic, 1DO, RS-485
METSEPM5111	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 15th harmonic, 1DO, RS-485, MID
METSEPM5310	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO, RS-485
METSEPM5310R	Power Meter, 600V AC L-L/ RJ45 LVCT input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO, RS-485
METSEPM5320	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO, Ethernet
METSEPM5320R	Power Meter, 600V AC L-L/ RJ45 LVCT input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO, Ethernet
METSEPM5330	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO/2-Relay, RS-485
METSEPM5331	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO/2-Relay, RS-485, MID
METSEPM5340	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO/2-Relay, Ethernet
METSEPM5341	Power Meter, 600V AC L-L/ 5A or 1A input, 415V AC L-L or 250V DC control power, CI 0.5S, 31st harmonic, 256 kB, 2DI/2DO/2-Relay, Ethernet, MID
METSEPM5560	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet
METSEPM5561	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, MID
METSEPM5562	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, RMI CAN approved, Hardware lockable
METSEPM5562MC	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, RMI CAN approved, Factory sealed
METSEPM5563	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, DIN mount, No display
METSEPM5563RD	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, DIN mount, Remote display
METSEPM5570	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 2DI/2AI/2-DO, RS-485, Ethernet
METSEPM5580	Power Meter, 690V AC L-L/ 5A or 1A input, 24 to 64V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet
METSEPM5650	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 4DI/2-DO, RS-485, Ethernet, Wave Form Capture and Sag/swell
METSEPM5660	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 2DI/2-DO, RS-485, Ethernet, Residual Current Monitor
METSEPM5661	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 2DI/2-DO, RS-485, Ethernet, Residual Current Monitor, MID
METSEPM5760	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 2DI/2-DO, RS-485, Ethernet, Wave Form Capture and Sag/swell, Residual current monitor
METSEPM5761	Power Meter, 690V AC L-L/ 5A or 1A input, 480V AC L-L or 250V DC control power, CI 0.2S, 63rd harmonic, 1.1 MB, 2DI/2-DO, RS-485, Ethernet, Wave Form Capture and Sag/swell, Residual current monitor, MID

For selection of compatible current transformers with 5 A output in Schneider range: Refer **PLSED310169EN** in solid core and split core IEC type

For Residual Current Monitoring Toroids (Vigirex) - Closed Toroids, A Type (applicable for PM5660, PM5661, PM5760, PM5761)

50437	TA30 - closed toroid A type, for RCM enabled power meters, 30 mm inner diameter, rated current 65 Amps, 1000 turns
50438	PA50 - closed toroid A type, for RCM enabled power meters, 50 mm inner diameter, rated current 85 Amps, 1000 turns
50439	IA80 - closed toroid A type, for RCM enabled power meters, 80 mm inner diameter, rated current 160 Amps, 1000 turns
50440	MA120 - closed toroid A type, for RCM enabled power meters, 120 mm inner diameter, rated current 250 Amps, 1000 turns
50441	SA200 - closed toroid A type, for RCM enabled power meters, 200 mm inner diameter, rated current 400 Amps, 1000 turns
50442	GA300 - closed toroid A type, for RCM enabled power meters, 300 mm inner diameter, rated current 630 Amps, 1000 turns

Accessories for Closed Toroids (applicable for PM5660, PM5661, PM5760, PM5761)

56055	Magnetic ring/ Iron screen accessory for TA30 toroid sensor
56056	Magnetic ring/ Iron screen accessory for PA50 toroid sensor
56057	Magnetic ring/ Iron screen accessory for IA80 toroid sensor
56058	Magnetic ring/ Iron screen accessory for MA120 toroid sensor

Residual Current Monitoring Toroids (Vigirex) - Split Toroids, OA Type (applicable for PM5660, PM5661, PM5760, PM5761)

50420	TOA80 - split toroid OA type, 80 mm inner diameter, rated current 160 Amps, 1000 turns
50421	TOA120 - split toroid OA type, 120 mm inner diameter, rated current 250 Amps, 1000 turns
56053	L1 type - rectangular sensor, width 280 x height 115 mm, rated current 1600 Amps, 1000 turns
56054	L2 type - rectangular sensor, width 470 x height 160 mm, rated current 3200 Amps, 1000 turns

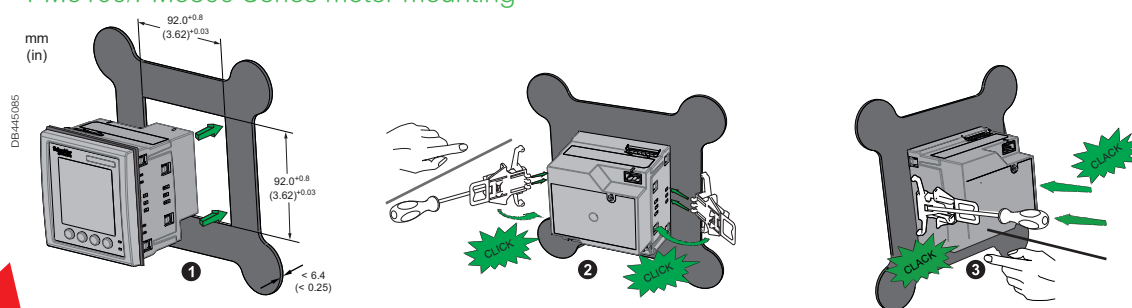
Current Transformer commercial reference numbers for PM53xxR

Comm. ref numbers	Description
0.333V (1/3 Volts), 3-in-1 CTs with RJ45 connectors for PM53x0R LVCT enabled power meter	
METSECTV25006	LVCT Solid core 3 in 1 with RJ45 cable, 25 mm phase center, 60 Amps, 0.333V output
METSECTV25010	LVCT Solid core 3 in 1 with RJ45 cable, 25 mm phase center, 100 Amps, 0.333V output
METSECTV25013	LVCT Solid core 3 in 1 with RJ45 cable, 25 mm phase center, 125 Amps, 0.333V output
METSECTV25016	LVCT Solid core 3 in 1 with RJ45 cable, 25 mm phase center, 160 Amps, 0.333V output
METSECTV35006	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 60 Amps, 0.333V output
METSECTV35010	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 100 Amps, 0.333V output
METSECTV35012	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 120 Amps, 0.333V output
METSECTV35013	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 125 Amps, 0.333V output
METSECTV35015	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 150 Amps, 0.333V output
METSECTV35016	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 160 Amps, 0.333V output
METSECTV35020	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 200 Amps, 0.333V output
METSECTV35025	LVCT Solid core 3 in 1 with RJ45 cable, 35 mm phase center, 250 Amps, 0.333V output
METSECTV45025	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 250 Amps, 0.333V output
METSECTV45030	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 300 Amps, 0.333V output
METSECTV45040	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 400 Amps, 0.333V output
METSECTV45050	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 500 Amps, 0.333V output
METSECTV45060	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 600 Amps, 0.333V output
METSECTV45063	LVCT Solid core 3 in 1 with RJ45 cable, 45 mm phase center, 630 Amps, 0.333V output
METSECTV29006	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 60 Amps, 0.333V output
METSECTV29010	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 100 Amps, 0.333V output
METSECTV29012	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 120 Amps, 0.333V output
METSECTV29013	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 125 Amps, 0.333V output
METSECTV29015	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 150 Amps, 0.333V output
METSECTV29016	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 160 Amps, 0.333V output
METSECTV29020	LVCT Solid core 3 in 1 with RJ45 cable, 29 mm phase center, 200 Amps, 0.333V output
METSECTV70080	LVCT Solid core 3 in 1 with RJ45 cable, 70 mm phase center, 800 Amps, 0.333V output
METSECTV70100	LVCT Solid core 3 in 1 with RJ45 cable, 70 mm phase center, 1000 Amps, 0.333V output
METSECTV70125	LVCT Solid core 3 in 1 with RJ45 cable, 70 mm phase center, 1250 Amps, 0.333V output
Cables for PM5563 and PM5563RD	
METSEPM5CAB03	RJ25 cable assembly for interfacing PM5563 meter and PM5RD remote display with 0.3 meter cable length
METSEPM5CAB1	RJ25 cable assembly for interfacing PM5563 meter and PM5RD remote display with 1.0 meter cable length
METSEPM5CAB10	RJ25 cable assembly for interfacing PM5563 meter and PM5RD remote display with 10 meter cable length
METSEPM5CAB3	RJ25 cable assembly for interfacing PM5563 meter and PM5RD remote display with 3 meter cable length
METSEPM5CAB4	RJ25 cable assembly for interfacing PM5563 meter and PM5RD remote display with 4 meter cable length
Other related products or accessories	
METSEPM5RD	Remote display unit for PM5563 power meter supplied with mounting bracket, gasket, anti-rotation pin and RJ25 cable METSEPM5CABxy
METSEPM51HK	Hardware kit for PM51xx comprises 2 retainer clips and spare connectors for - Voltage in, Control power in, Digital IO & RS-485
METSEPM53HK	Hardware kit for PM51xx comprises 2 retainer clips and spare connectors for - Voltage in, Control power in, Digital IO, Relay & RS-485
METSEPM51_3RSK	Revenue sealing kit for PM51XX & PM53XX
METSEPM55RSK	Revenue sealing kit for PM55XX
METSEPM55HK	Hardware kit for PM55xx

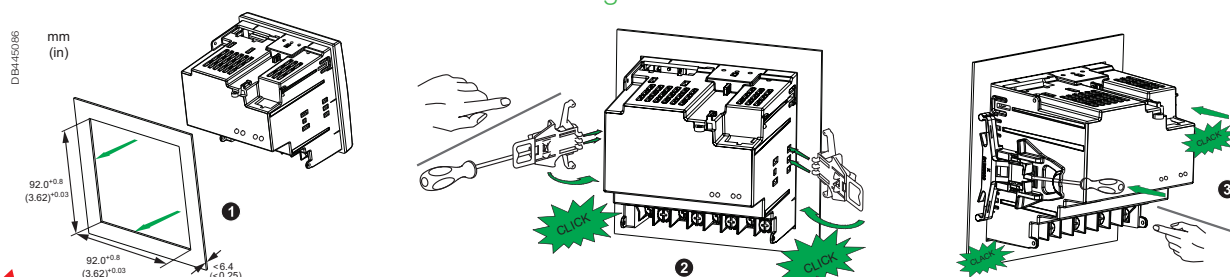
Please contact your Schneider Electric representative for complete ordering information.

PM5000 series

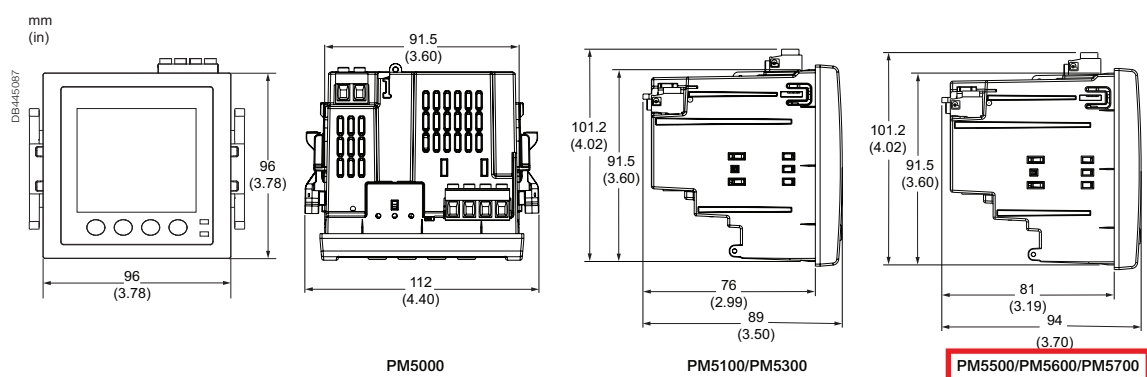
PM5100/PM5300 Series meter mounting



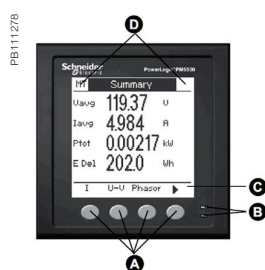
PM5500/PM5600/PM5700 series meter mounting



PM5000 series meter dimensions

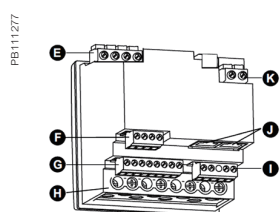


PM5000 series overview



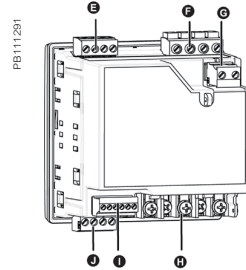
PM5000 meter parts

- A Menu selection buttons
- B LED indicators
- C Navigation or menu selections
- D Maintenance and alarm notification area



PM5500/PM5600/PM5700 meter parts

- E Voltage inputs
- F RS-485 comms
- G Digital inputs
- H Current inputs
- I Digital outputs
- J Ethernet ports
- K Control power



PM5100/PM5300 meter parts

- E Relay output (PM5300 only)
- F Voltage inputs
- G Control power
- H Current inputs
- I Status inputs/digital outputs
- J Communications port: Ethernet (PM5300 only) or RS-485

Please see the appropriate **Installation Guide** for accurate and complete information on the installation of this product.



www.se.com

Schneider Electric Industries SAS
35, Rue Joseph Monier
CS 30323
92506 Rueil Malmaison Cedex

RCS Nanterre 954 503 439
Capital social 928 298 512 €
www.se.com

February 2023
PowerLogic™ PM5000 series
PLSED310052EN

© 2023 - Schneider Electric. All rights reserved.
All trademarks are owned by Schneider Electric
Industries SAS or its affiliated companies.

As standards, specifications and designs develop from time to time, please
ask for confirmation of the information given in this document.

Over 75 % of Schneider Electric products
have been awarded the Green Premium ecolabel.



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.

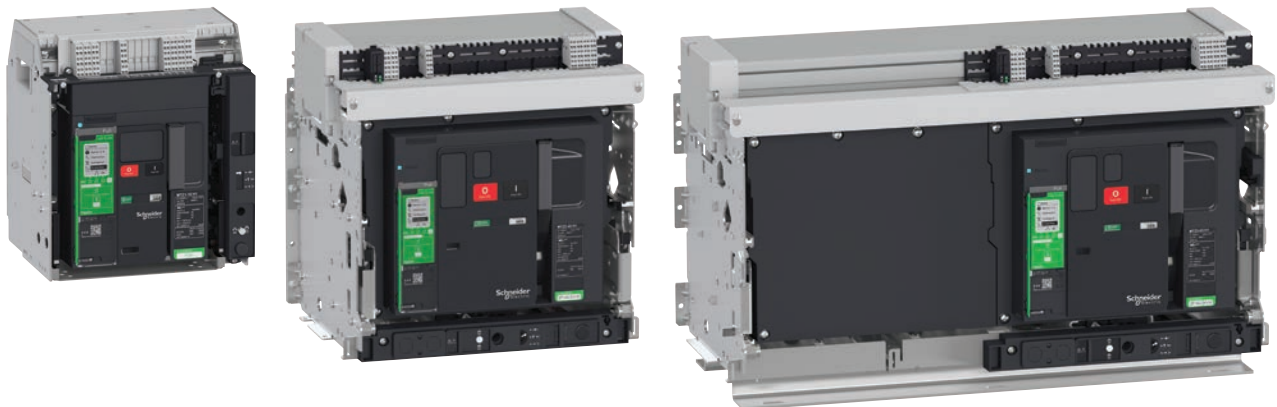
Masterpact MTZ Circuit Breaker Overview

Masterpact MTZ circuit breakers are available in three sizes.

Masterpact MTZ1
800–1600 A

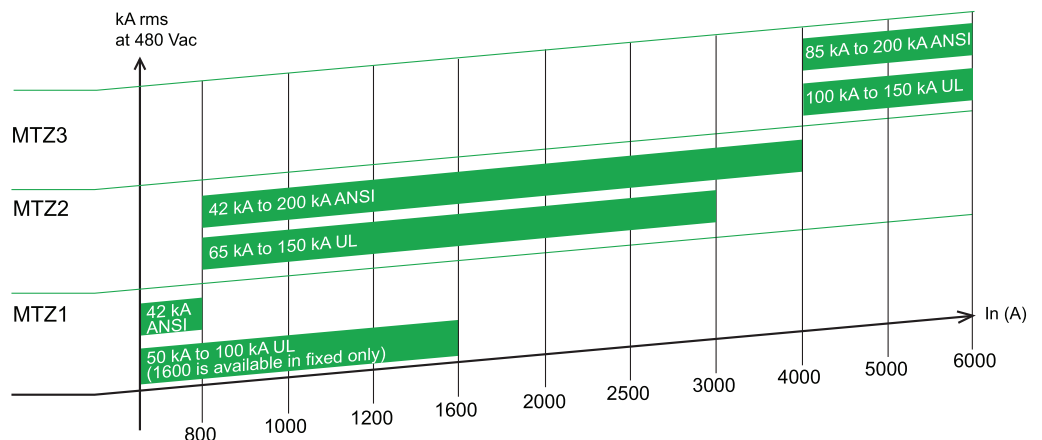
Masterpact MTZ2
800–4000 A

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.



Selecting Masterpact MTZ2 Circuit Breakers

Ratings for UL489 Masterpact MTZ2 Circuit Breakers

Frame Rating		800/1200/1600/2000 A				2500/3000 A	
Number of Poles		3/4					
Interrupting Rating Code		N	H	L	LF	H	L
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 ³	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 ⁴	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 ⁵	12,500 ⁵	12,500 ⁵	12,500 ⁵	10,000	10,000
	Electrical	2800 ⁵	2800 ⁵	2800 ⁵	2800 ⁵	1000	1000

Ratings for ANSI C37 Certified Masterpact MTZ2 Circuit Breakers

Frame Rating		800/1600 A						2000 A					3200/4000 A			
Number of Poles		3/4														
Interrupting Rating Code		N1	H1	H2	H3	L1 ^{6 7}	L1F ⁷	H1	H2	H3	L1 ^{6 7}	L1F ⁷	H1	H2	H3	L1 ^{6 7}
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	150	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)	Mechanical	12,500						10,000					10,000		5000	
	Electrical	2800						1000					1000		1000	

3. 65 kA for 2000 A.
4. 90 kA for 2000 A.
5. The endurance rating for 2000 A, N/H/L/LF is 10,000 for mechanical and 1000 for electrical.
6. Interrupting ratings (kAIR) at 50 Hz: 200 kA (254 Vac), 150 kA (508 Vac), 100 kA (635 Vac).
7. The interrupting ratings L1 and L1F are available only in 3P, drawout construction.

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

THIS PAGE WAS INTENTIONALLY LEFT BLANK

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

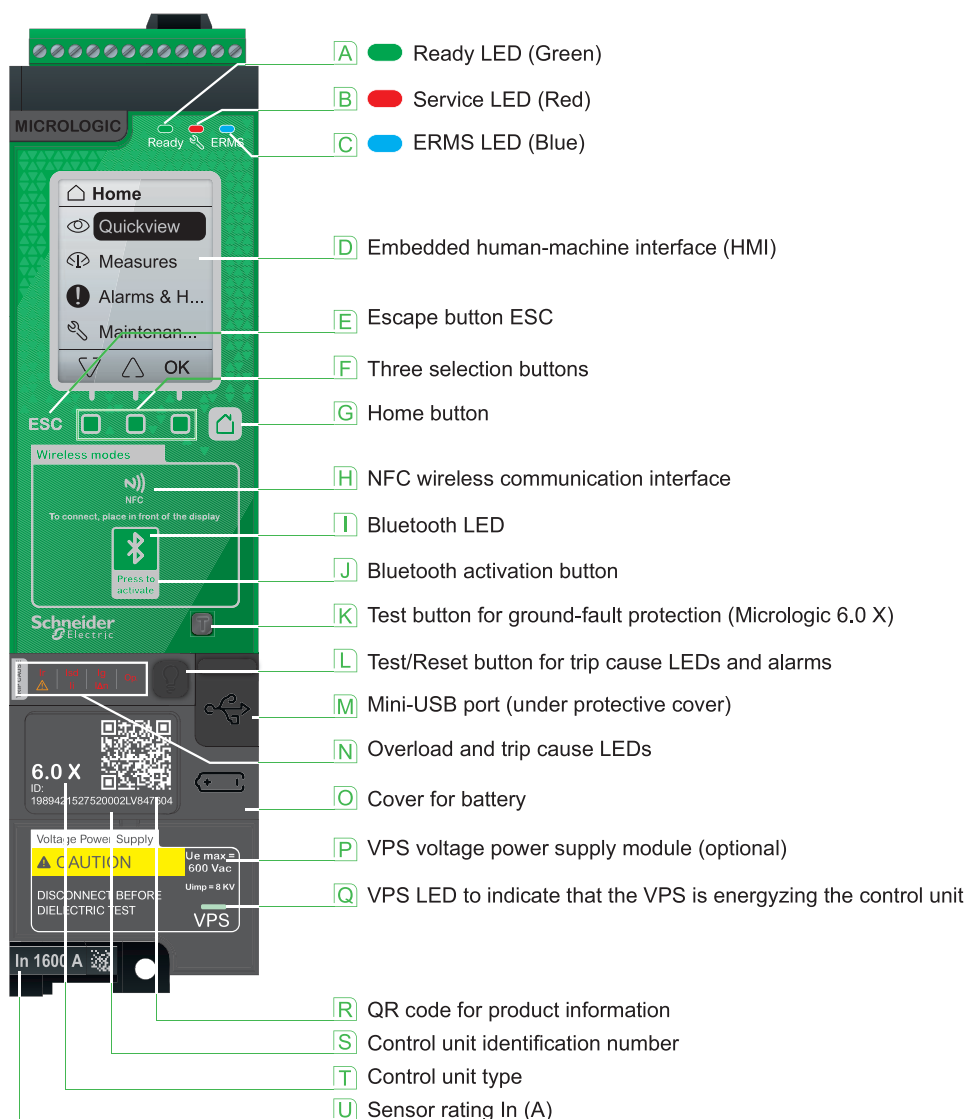
- Access data locally, using the control units embedded human-machine interface (HMI). This digital display provides local viewing of power system operation and maintenance information.
- Access data remotely, using fast and robust communication options such as wireless or Ethernet. This provides remote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

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.

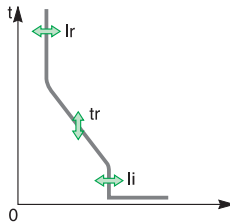
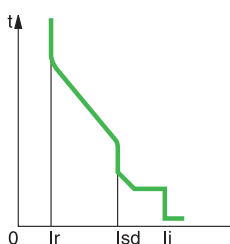
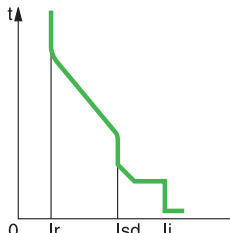
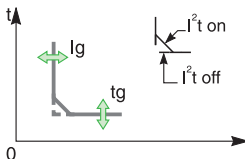
The backlit display will change colors for various states, providing a clear indication when attention is needed.

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 configuration is easily made through the Ecoreach tool.

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 t_{sd} as soon as the setting current I_{sd} is exceeded.
- When I^2t is ON, an inverse time characteristic is selected.
The protection operates with the inverse time characteristic up to $10 \times I_r$ and with a definite time characteristic above $10 \times I_r$.

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 without additional time delay when the setting current I_i 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).

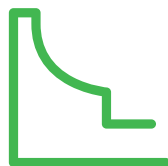
Ground-Fault Protection (ANSI 50N-TD/51N)

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]¹⁰) 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.

10. For SGR option please consult Schneider Electric.

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 ⁴¹
Ir ERMS	Same as: L protection	In
tr ERMS	Same as: L protection	0.5
lsd ERMS	Same as: S protection	1.5 x Ir
tsd ERMS	Same as: S protection	0
li ERMS	Same as: I protection	2
li ERMS operating time	Same as: I protection	fast
lg ERMS	Same as: G protection	0.2
tg ERMS	Same as: G protection	0

41. ERMS LSIG factory settings.

THIS PAGE WAS INTENTIONALLY LEFT BLANK