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## MPD-CS-SF6-3P3W-138KV-9CB-1AT-3000A

# SF6 Circuit Breaker Protection & Control Panel Lineup (Breaker-and-a-Half) - 9 Breaker Positions / 1 Autotransformer Position, 138kV Class, 3000A Main Bus

**Product ID: 342183**



Image: MPD-CS-SF6-3P3W-138KV-9CB-1AT-3000A

**Larson Electronics LLC manufactures a wide variety of products, including custom built to spec designs. The pictures displayed for this unit are a general representation of form factor for the product line and may not accurately represent this exact configuration in every detail due to custom builds and changes between similar products in our standard catalog. The specifics for this configuration are listed in the specification table and supporting documentation (CAD files, Dimensional Drawing, Name Plate Diagram, Wiring Diagram, etc.). This means that specific details (receptacles, plugs, wires, connections, mounting brackets, external finishes, etc.) may not be accurately represented in images vs specifications. Please review specifications and do not order based solely on images.**

**MPD-CS-SF6-3P3W-138KV-9CB.1AT-3000A-S.R.M.-FM-N1.N3R-DF SF6 Circuit Breaker Protection & Control Panel Lineup**

**Made in the USA**

**Unit Type:** SF6 Gas Circuit Breaker Protection & Control Panel Lineup, 9 Breaker Positions / 1 Autotransformer Protection Position

**Configuration:** 3-Phase, 3-Wire, Dead Front
**Assembly Type:** 9 SF6 Circuit Breaker Positions (3 Bays × 3 Positions) plus 1 Autotransformer Protection Position
**Nominal Voltage:** 138kV (Breaker Bays); Autotransformer Position: 161kV High-Side / 138kV Low-Side / 13.2kV Tertiary
**Main Bus Continuous Current:** 3000A (Breaker Bays) — Autotransformer Position Bus: 1200A

**Breaker Interrupting Rating:** 40kA Symmetrical (Breaker Bays)

**Mounting Style:** Fixed Type, Floor-Mounted
**Enclosure Type:** NEMA 1, Indoor — Applies to the Relay/Protection/Metering/SCADA Panel Package
**Primary Switchyard Equipment (SF6 Circuit Breakers, Current Transformers, Capacitive Voltage Transformers, Surge Arresters, Wave Traps/Line Tuning Units): NEMA 3R, Outdoor**
**Connection Points:** Bus-side and breaker-side terminations per position; line-end and customer/utility interconnection terminations are outside this scope of supply

**Bay 1 — Breaker Positions (Qty 3)**
Three (3) SF6 Gas Circuit Breakers, 3-Pole, 3000A Continuous, 40kA Symmetrical Interrupting, Motor-Operated, Hotstick-Operable Disconnect Provisions

**Features of Every Section**

Dead Front Construction

Fixed, Floor-Mounted Panel Construction

Dual-Redundant (Primary/Alternate) Protection Scheme, Every Position
Surge Arrester, Relay, and Metering (S.R.M.) Package, Every Position
Revenue-Grade Metering, Each Bay

Current Transformers: 3000:5 Multi-Ratio, Two (2) Sets per Breaker Position (Bus-Side and Line-Side Bushings)
Capacitive Voltage Transformers (CVT): 80.5kV : 115/67.08V Ratio, One Set per Line Position
Surge Arresters: Station Class, 98kV MCOV Rated
Wave Trap and Line Tuning Unit: One Set, Line Position (Power Line Carrier Provision)
Optical Ground Wire (OPGW) Termination Provision, Line Position

**Protection & Relay Configuration — Bay 1**
SEL 487B (or shorter lead time equivalent): Primary and Alternate Line/Bus Differential Relay, One Set per Position — Functions 87L, 87B, 86BF, 86TT
SEL 351S (or shorter lead time equivalent): Primary and Alternate Distance/Directional/Reclosing Relay, One Set per Position — Functions 21P/21A, 67P/67A, 79, 50BF, 25
SEL 411L (or shorter lead time equivalent): Line Current Differential/Distance/Directional Metering Relay — Functions 87LA/21A/67A

**Connections — Bay 1**
Continuous Copper Tie Bus, Bay 1 to Bay 2
Breaker Failure Initiate/Trip Interlock Wiring Between All Bay 1 Positions

**Bay 2 — Breaker Positions (Qty 3)**
Three (3) SF6 Gas Circuit Breakers, 3-Pole, 3000A Continuous, 40kA Symmetrical Interrupting, Motor-Operated
Current Transformers: 3000:5 Multi-Ratio, Two (2) Sets per Breaker Position
Capacitive Voltage Transformers (CVT): 80.5kV : 115/67.08V Ratio, One Set per Line Position
Surge Arresters: Station Class, 98kV MCOV Rated
Optical Ground Wire (OPGW) Termination Provision, Line Position

**Protection & Relay Configuration — Bay 2**
SEL 487B (or shorter lead time equivalent): Primary and Alternate Line/Bus Differential Relay, One Set per Position — Functions 87L, 87B, 86BF, 86TT
SEL 351S (or shorter lead time equivalent): Primary and Alternate Distance/Directional/Reclosing Relay, One Set per Position — Functions 21P/21A, 67P/67A, 79, 50BF, 25
SEL 411L (or shorter lead time equivalent): Line Current Differential/Distance/Directional Metering Relay

**Connections — Bay 2**
Continuous Copper Tie Bus, Bay 1 to Bay 2 to Bay 3
Breaker Failure Initiate/Trip Interlock Wiring Between All Bay 2 Positions

**Bay 3 — Breaker Positions (Qty 3)**
Three (3) SF6 Gas Circuit Breakers, 3-Pole, 3000A Continuous, 40kA Symmetrical Interrupting, Motor-Operated
Current Transformers: 3000:5 Multi-Ratio, Two (2) Sets per Breaker Position
Capacitive Voltage Transformers (CVT): 80.5kV : 115/67.08V Ratio, One Set per Line Position
Surge Arresters: Station Class, 98kV MCOV Rated
Single-Phase Auxiliary Transformer Provision, One Position (Station Auxiliary Power)
Optical Ground Wire (OPGW) Termination Provision, Line Position

**Protection & Relay Configuration — Bay 3**
SEL 487B (or shorter lead time equivalent): Primary and Alternate Line/Bus/Autotransformer-Adjacent Differential Relay, One Set per Position — Functions 87L, 87T1, 86BF, 86TT
SEL 351S (or shorter lead time equivalent): Primary and Alternate Distance/Directional/Reclosing Relay, One Set per Position — Functions 21P/21A, 67P/67A, 79, 50BF, 25
SEL 411L (or shorter lead time equivalent): Line Current Differential/Distance/Directional Metering Relay

**Connections — Bay 3**
Continuous Copper Tie Bus, Bay 2 to Bay 3
Breaker Failure Initiate/Trip Interlock Wiring Between All Bay 3 Positions

**Autotransformer Protection Position (Auto T1) — Qty 1**
Autotransformer Bank Protection: 161kV High-Side / 138kV Low-Side / 13.2kV Tertiary
Current Transformers: 1200:5 Multi-Ratio (dedicated to the autotransformer's protection zone — lower rating than the 3000A breaker-bay bus)
Capacitive Voltage Transformer (CVT): 80.5kV : 115/67.08V Ratio
Surge Arresters: 98kV MCOV, 120kV Rated
Single-Phase Auxiliary Transformer Provision, 13.2kV–120/240V

**Protection & Relay Configuration — Auto T1**
SEL 487B (or shorter lead time equivalent): Primary and Alternate Autotransformer Differential Relay — Functions 87T1P/87T1A, 86T1P/86T1A (Lockout)
SEL 351S (or shorter lead time equivalent): Primary and Alternate Distance/Directional Relay — Functions 21P/21A, 67P/67A
SEL 411L (or shorter lead time equivalent): Line Differential/Distance/Directional Metering Relay

**Connections — Auto T1**
Bus Interconnection Between 161kV and 138kV Systems Through the Autotransformer Bank
Breaker Failure Initiate/Trip Interlock Wiring, Auto T1 Position

**SCADA & Metering**
SCADA Panel Provision, Each Bay
Revenue-Grade Multifunction Metering Units, Each Bay (3× per 138kV Bay, 1× at Auto T1)

**Construction**

Relay/Protection/Metering/SCADA Panel Enclosures: NEMA 1, Indoor, Fixed Floor-Mounted, Dead Front

SF6 Circuit Breakers, Current Transformers, Capacitive Voltage Transformers, and Surge Arresters: NEMA 3R, Outdoor-Rated Switchyard Apparatus

**Ratings & Approvals**
Designed in accordance with applicable ANSI/IEEE C37 series standards for gas circuit breakers and station protection systems

NRTL Listed Service Equipment

All grounding shall comply with applicable state and local codes and NEC requirements

**Dimensions & Shipping**
**Overall Indoor Panel Lineup Dimensions:** 312 in W × 30 in D × 90 in H (estimated) — indoor panel lineup only
**Approximate Indoor Panel Lineup Weight:** 8,500 lbs (estimated) — indoor panel lineup only; outdoor switchyard equipment (breakers, CTs, CVTs, surge arresters) not included in this estimate
**Shipping Dimensions:** TBD
**Shipping Weight:** TBD
Outdoor Switchyard Equipment (Breakers, CTs, CVTs, Surge Arresters): Shipped and Installed Separately Per Standard Utility Practice

**Shipping**

Shipped on pallet or skid

Crated shipment available upon request

Final shipping configuration subject to approved design

**Special Features**
SF6 Gas Circuit Breaker Technology, Dual-Redundant (Primary/Alternate) Protection Scheme, Integrated Surge/Relay/Metering (S.R.M.) Package, Power Line Carrier Provisions (Wave Trap/LTU)

**Special Orders – Special Requirements**

Contact us for special requirements

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**Customer Compliance**
Final arrangements, sizes, ratings, settings, configuration, and installation details will be finalized during detailed engineering review and customer approval prior to release for manufacture.

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Larson Electronics manufactures a wide variety of custom power distribution systems. The pictures displayed for this unit are a general representation of form factor and may not accurately represent this exact configuration in every detail due to being custom builds. The specifics for this configuration are listed in the specification table and applicable drawings.

**Made in the USA**

**The MPD-CS-SF6-3P3W-138KV-9CB.1AT-3000A-S.R.M.-FM-N1.N3R-DF is a 138kV-class SF6 gas circuit breaker protection and control panel lineup, comprising nine (9) circuit breaker positions arranged across three breaker bays plus one (1) dedicated autotransformer protection position.**

***PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS****

This lineup is engineered for transmission-class station protection and control applications, integrating dual-redundant (Primary/Alternate) microprocessor-based relaying, revenue-grade metering, and surge protection at every position. The relay, protection, metering, and SCADA panel package is fixed, floor-mounted, NEMA 1 indoor construction; the SF6 circuit breakers, current transformers, capacitive voltage transformers, and surge arresters are outdoor switchyard apparatus, engineered and rated NEMA 3R independent of the indoor panel enclosure. The three breaker bays operate at a 3000A main bus continuous rating with 40kA symmetrical interrupting capacity, while the autotransformer protection position — dedicated to a 161kV high-side / 138kV low-side / 13.2kV tertiary autotransformer bank — carries a distinct, lower 1200A current transformer rating reflecting its dedicated protection zone. Each breaker and protection position is built for continuous, unattended station operation with full breaker-failure backup and lockout schemes.

**Bay 1 — Breaker Positions**
Bay 1 comprises three SF6 gas circuit breaker positions, each 3-pole, 3000A continuous, 40kA symmetrical interrupting, and motor-operated with hotstick-operable disconnect provisions. Each position is instrumented with two sets of 3000:5 multi-ratio current transformers (bus-side and line-side bushings) and, at the line position, a capacitive voltage transformer rated 80.5kV : 115/67.08V. Station-class surge arresters rated 98kV MCOV protect each position, and the line position includes a wave trap and line tuning unit for power line carrier protection, along with an optical ground wire termination provision.

**Bay 2 — Breaker Positions**
Bay 2 comprises three SF6 gas circuit breaker positions of identical rating and construction to Bay 1 — 3-pole, 3000A continuous, 40kA symmetrical interrupting, motor-operated — each instrumented with two sets of 3000:5 multi-ratio current transformers, a line-position capacitive voltage transformer (80.5kV : 115/67.08V), 98kV MCOV station-class surge arresters, and an optical ground wire termination provision at the line position.

**Bay 3 — Breaker Positions**
Bay 3 comprises three SF6 gas circuit breaker positions of identical rating and construction to Bays 1 and 2, with the same current transformer, voltage transformer, and surge arrester instrumentation, plus a single-phase auxiliary transformer provision for station auxiliary power and an optical ground wire termination provision at the line position.

**Autotransformer Protection Position**
The autotransformer protection position provides dedicated protection for a 161kV/138kV/13.2kV autotransformer bank, instrumented with 1200:5 multi-ratio current transformers, an 80.5kV : 115/67.08V capacitive voltage transformer, and 120kV-rated, 98kV MCOV surge arresters. A single-phase auxiliary transformer provision (13.2kV–120/240V) supports station auxiliary loads at this position.

**Protection & Relay Configuration**
Each breaker position throughout the lineup is protected by a dual-redundant (Primary and Alternate) relay set: SEL 487B (or shorter lead time equivalent) line/bus differential relays providing functions 87L, 87B, 86BF, and 86TT; SEL 351S (or shorter lead time equivalent) distance, directional, and reclosing relays providing functions 21P/21A, 67P/67A, 79, 50BF, and 25; and SEL 411L (or shorter lead time equivalent) line current differential/distance/directional metering relays. The autotransformer protection position carries the same dual-redundant relay platform configured for autotransformer differential protection (87T1P/87T1A) with primary and alternate lockout relays (86T1P/86T1A), plus distance and directional functions (21P/21A, 67P/67A).

**SCADA & Metering**
Each bay includes a SCADA panel provision for remote monitoring and control, along with revenue-grade multifunction metering units — three per 138kV breaker bay and one at the autotransformer protection position.

**Construction**
The relay/protection/metering/SCADA panels are of NEMA 1 indoor, fixed floor-mounted, dead front construction, arranged for front-accessible operation and maintenance. The SF6 circuit breakers, current transformers, capacitive voltage transformers, and surge arresters are NEMA 3R outdoor-rated switchyard apparatus.

**Special Features**
SF6 gas circuit breaker technology throughout, dual-redundant (Primary/Alternate) protection scheme at every position, integrated surge arrester/relay/metering (S.R.M.) package, and power line carrier provisions (wave trap and line tuning unit) at applicable line positions.

**Ratings & Approvals**
This lineup is designed in accordance with applicable ANSI/IEEE C37 series standards for gas circuit breakers and station protection systems, is NRTL listed service equipment, and all grounding complies with applicable state and local codes and NEC requirements.

**Customer Compliance**
The final arrangements, sizes, ratings, settings, configuration, and installation details of this equipment will be established in accordance with detailed engineering review, applicable project documentation, and customer approval prior to manufacture.

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accurately represent this exact configuration in every detail due to being custom builds. The specifics for this configuration are listed in the specification table and one-line diagram.

At Larson Electronics, we do more than meet your lighting needs. We also provide replacement, retrofit, and upgrade parts as well as industrial grade power accessories. Our craftsmen can custom build any lighting system and/or accessories to fit the unique demands of your operation. A commitment to honesty, quality, and dependability has made Larson Electronics a leader in the lighting and electronics business since 1973. Contact us today at 800-369-6671 or message sales@larsonelectronics.com for more information about our custom options tailored to meet your specific industry needs.

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# Frequently Asked Questions (FAQ)

There are no Faqs