TYPE PSV
AUTOMATIC DEAD-FRONT PAD-MOUNTED SWITCHGEAR
15kV • 25kV

Air-Insulated Dead-Front Pad-Mounted Switchgear, Three-Phase, with options for:
Group Operated Air Load-Interrupter Switches
Group Operated Vacuum Switches
Group Operated Air Load-interrupter Switch and Vacuum Switch Combinations
Group Operated Three Phase Vacuum Circuit Breakers
Group Operated Air Load-interrupter Switch and Vacuum Circuit Breaker Combinations
Three, Single Phase, Vacuum Circuit Breakers
Hookstick Operated Fuses with Bushing Wells for 200-Ampere Load-Break Elbows

Figure I

Federal Pacific Automatic Dead-Front Type PSV Pad-Mounted Switchgear is constructed using the same methods and details of the Type PSE gear.

The Federal Pacific PSV enclosure design provides increased security of protection and switch components from environmental concerns and enhanced isolation of medium-voltage circuits to limit exposure of operating personnel.

Federal Pacific PSV pad-mounts feature a low-profile, heavy-gauge enclosure with a cross-kinked roof to eliminate the potential for standing water. Stainless-steel hinges and hinge pins combined with the padlockable, self-resetting, three-point, auto-latch door security system assures durability while controlling access to the interior.

Double-door construction allows clear access to elbow terminations. Ground rods that are the full width of door opening make grounding of circuits and installation of surge arresters easy to achieve when using a "shotgun" clampstick. Enclosure bottom flange includes gasketing to isolate and protect the finish during installation and throughout the service life of the switchgear.

Galvanized-steel floor plate on the bottom of the compartment containing medium voltage components isolates the interior from moisture and ingress of other contaminates. Thermostatically controlled space heaters are standard for the medium voltage compartment and low voltage control compartment, where applicable. Control power is derived from one or more local voltage transformers, so that the PSV does not require external control power.

The electrostatically deposited, baked-on powder epoxy finish meets IEEE, ANSI, and UL® requirements and provides a tough, durable high-gloss finish with protective qualities essential to insure long-term protection of the metal.

Federal Pacific PSV switchgear is constructed the same way as IEEE C37.74 rated Type PSE switchgear. Type PSV ratings are based on Type PSE switchgear and individual power component ratings.

FEDERAL PACIFIC™

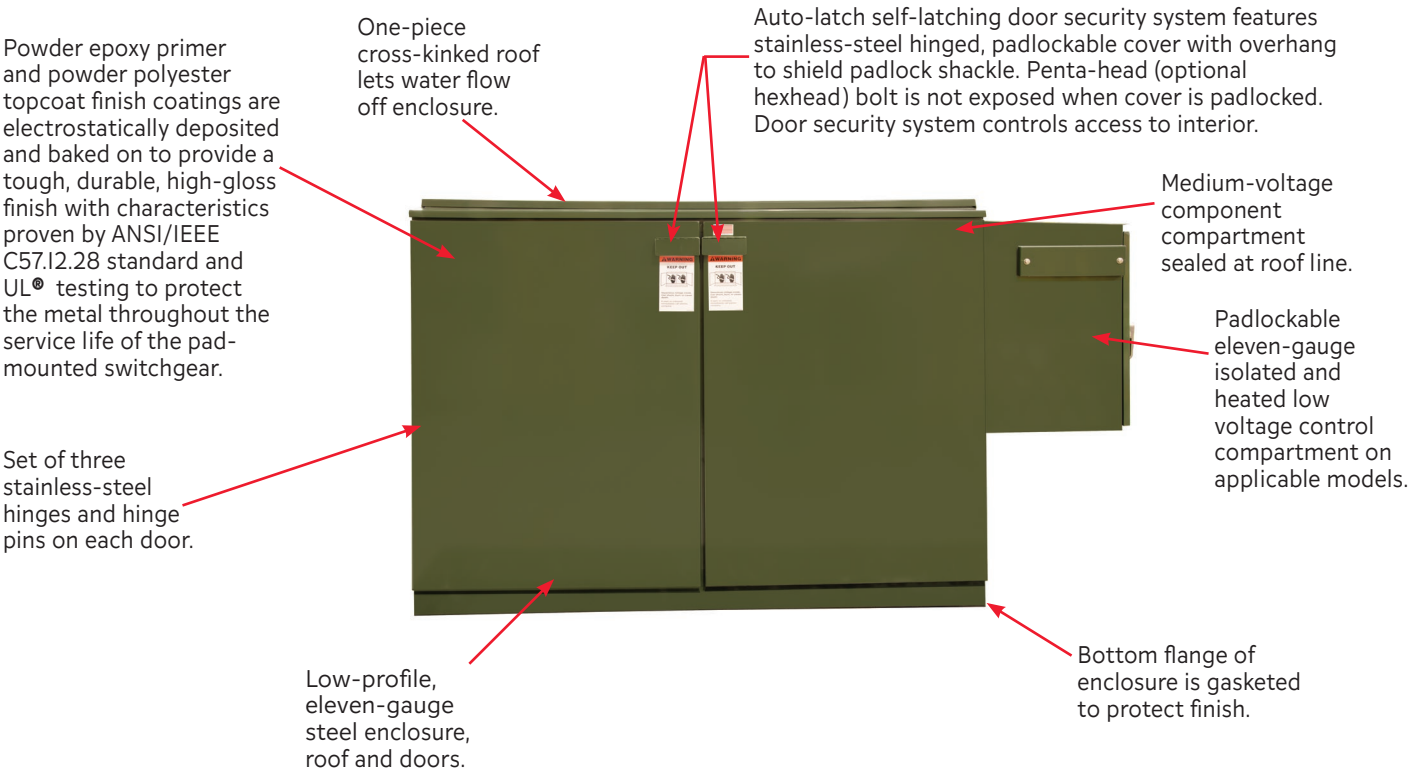


Figure 2

Enclosure integrity and security is assured with Federal Pacific pad-mounted switchgear.

General

- 15kV and 25kV Type PSV Class Dead-Front Pad-Mounted Switchgear
- Proven Auto-jet® load-break air switching.
- Auto-Jet® Manual Load-Break Air Switches meet IEEE C37.74-requirements including 3-time fault-closing on switches and fuse mountings
- Cycloaliphatic epoxy insulators.
- Eleven-gauge pickled-and-oiled steel, all welded enclosure construction. Stainless steel is available.
- A 16-gauge galvanized steel floor panel with 1" stainless-steel screened drainage provisions.
- Meets IEEE C57.12.28 cabinet security and enclosure finish requirements
- Stainless-steel door-handle covers and switch operating pockets
- Stainless-steel hinges and hinge pins
- Door system over every compartment with 3-point auto-latch door mechanism, padlockable door handle, and standard penta-head or optional hex-head security bolts
- Ventilation louvers are not required in the cable compartments but may be specified.
- Ventilation is standard on the low-voltage control compartment located on the side of the enclosure. Top left and bottom right vents, and standard thermostatically controlled space heaters, ensure that the inside does not overheat due to solar energy, or sweat due to cold ambient temperatures.
- The medium voltage equipment compartment is fitted with thermostatically controlled space heaters.
- Anti-condensation roof undercoating is in the medium voltage gear compartment.
- With power fuses, hinged fuse panels provide visible isolation from the internal bus
- With power fuses, NEMA Class GPO-3 non-hygroscopic fiberglass reinforced polyester barriers block access to the internal bus when the fuse panels are opened.

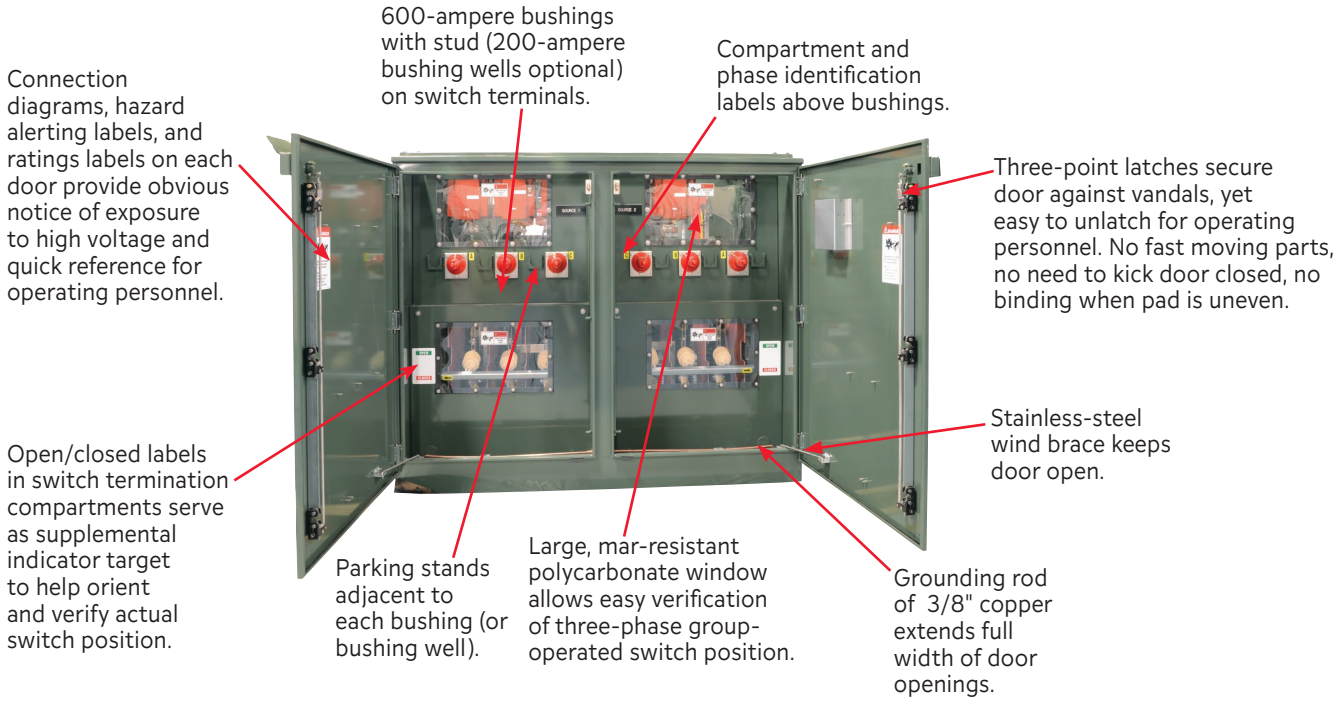


Figure 3

Typical PSV features of Auto-jet® source ways

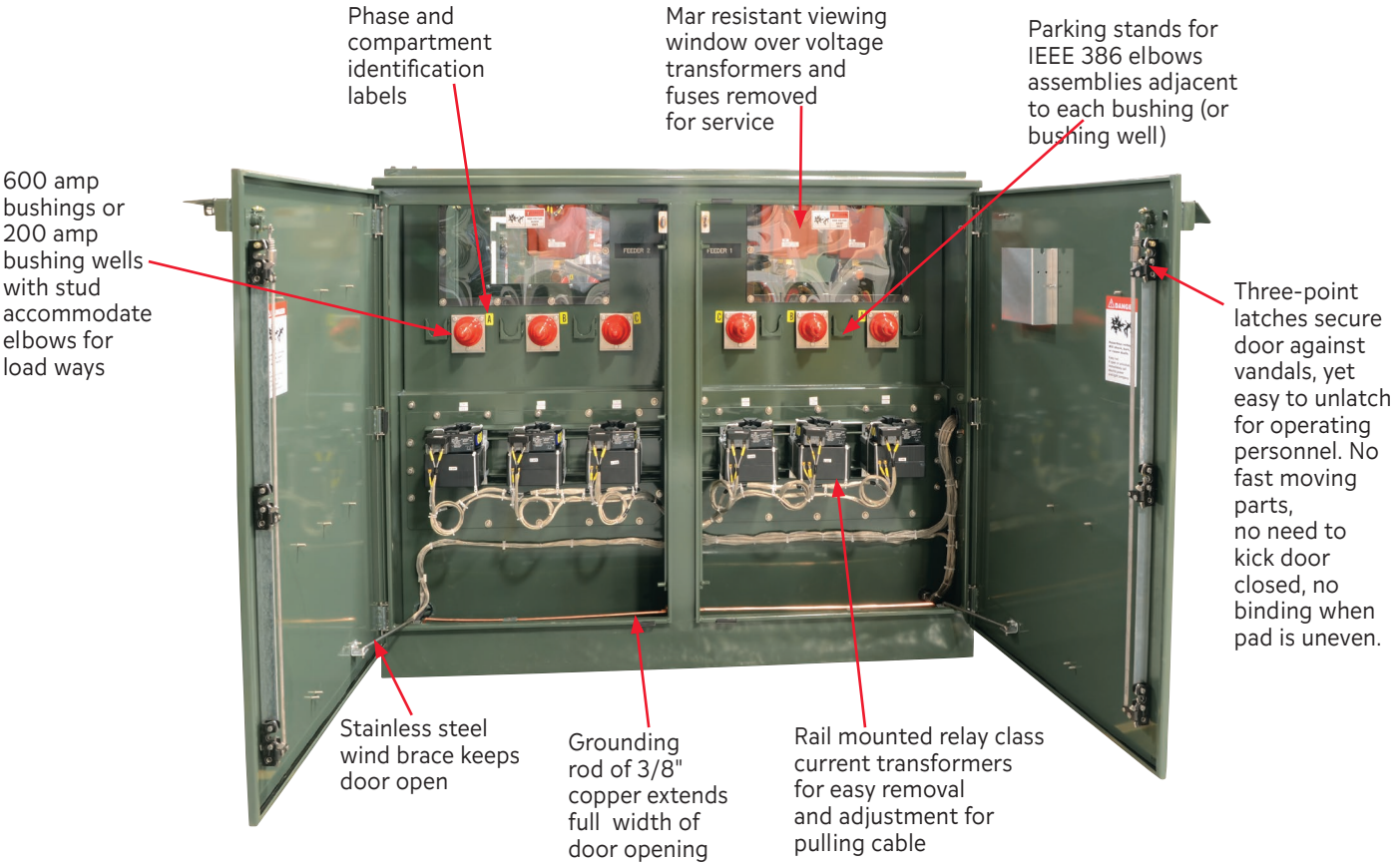


Figure 4

Typical features of PSV vacuum circuit breaker protected ways

Notes:

600 amp bushings or 200 amp bushing wells with studs accommodate elbows for load ways.
Phase and compartment identification labels
Mar-resistant viewing window of voltage transformers and fuses can be removed for service.
Mar-resistant viewing window over Auto-jet® load break air switch for positive open closed indication.
Parking stands for IEEE 386 elbows assemblies adjacent to each bushing (or bushing well).
Rail mounted relay class current transformers for easy removal and adjustment for pulling cable.
3/8" copper ground rod runs full width of door opening.
Slam latch stainless steel assembly on each door.
Separate low voltage lockable control compartment is completely isolated from medium voltage compartment.
Stainless steel wind brace keeps door open.

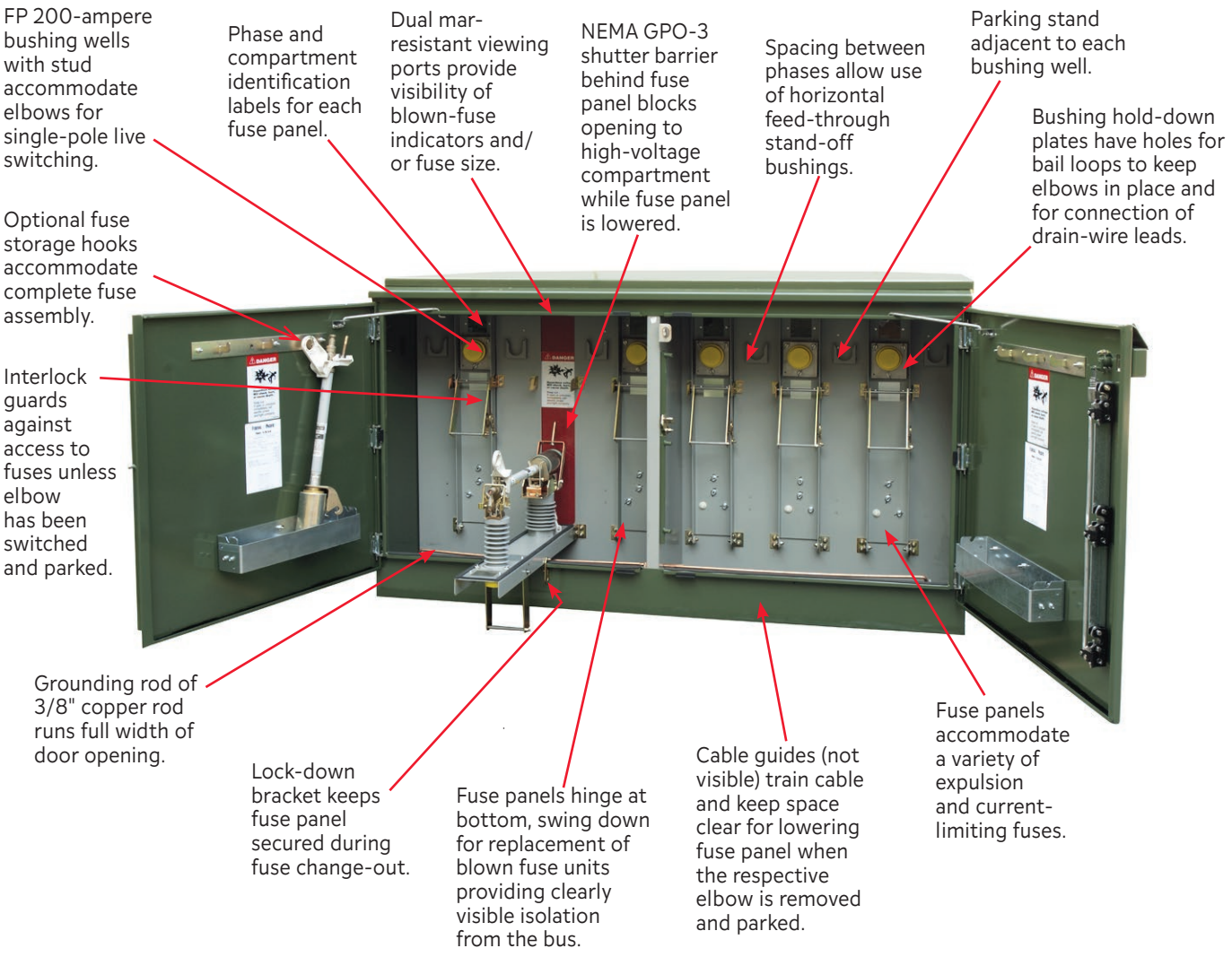


Figure 5

*Typical features of PSV fuse protected ways**

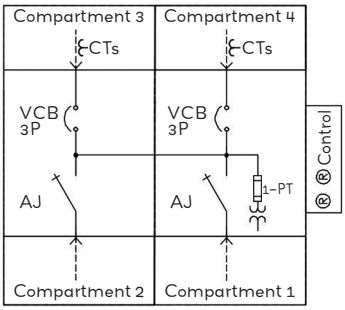
**Consult "I5kV and 25kV Standard PSV Configuration" charts for typical height.*

15kV Standard PSV Configuration

14.4kV Nominal • 95 kV BIL • 3 Phase

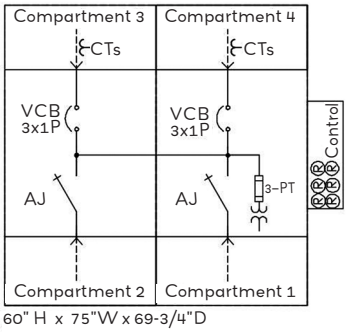
Circuit Diagrams with Compartment Numbers

Catalog No. 441144XX



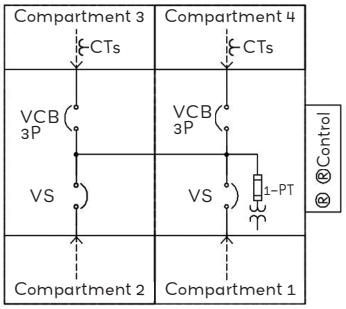
60" H x 75"W x 69-3/4"D
Two AJ Switches
Two Three Phase VCBs

Catalog No. 441155XX



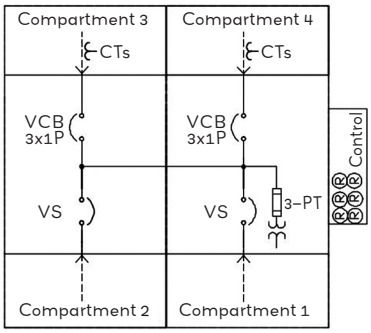
60" H x 75"W x 69-3/4"D
Two AJ Switches
Six Single Phase VCBs

Catalog No. 442244XX



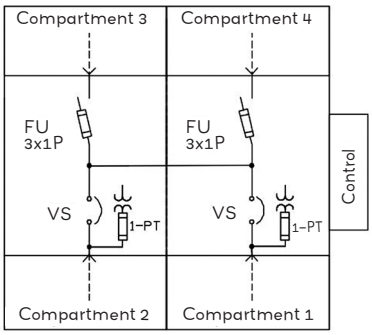
60" H x 75"W x 69-3/4"D
Two Three Phase VSs
Two Three Phase VCBs

Catalog No. 442255XX



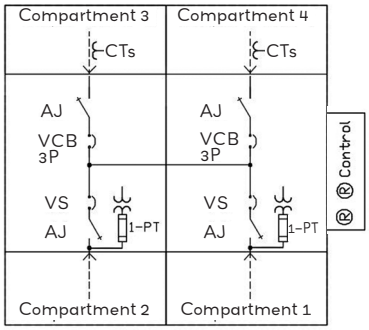
60" H x 75"W x 69-3/4"D
Two Three Phase VSs
Six Single Phase VCBs

Catalog No. 442288XX



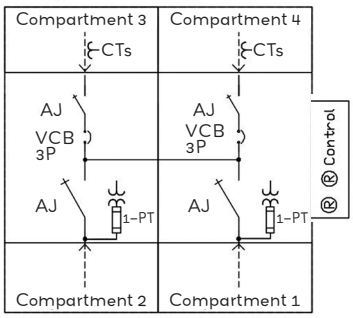
60" H x 75"W x 69-3/4"D
Two Three Phase VSs
Six Single Phase Power Fuses

Catalog No. 443366XX



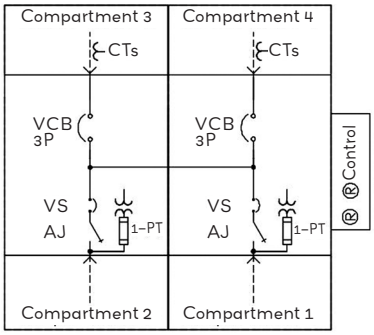
65-3/8" H x 75"W x 72-1/2"D
Two AJ Switches + Two 3-Phase VSs
Two AJ Switches + Two 3-Phase VCBs

Catalog No. 441166XX



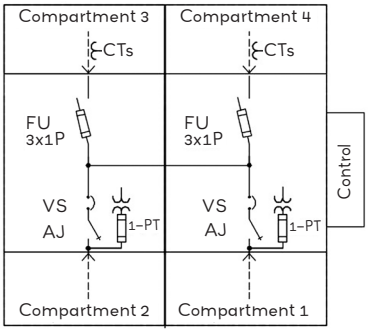
65-3/8" H x 75"W x 72-1/2"D
Two AJ Switches
Two AJ Switches + Two 3-Phase VCBs

Catalog No. 443344XX



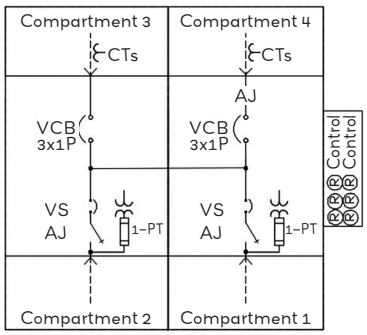
65-3/8" H x 75"W x 72-1/2"D
Two AJ Switches
Two 3-Phase VCBs

Catalog No. 443388XX



65-3/8" H x 75"W x 72-1/2"D
Two AJ Switches + Two 3-Phase VSs
Six Single Phase Power Fuses

Catalog No. 443355XX



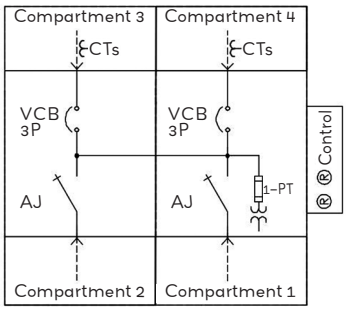
65-3/8" H x 75"W x 72-1/2"D
Two AJ Switches + Two 3-Phase VSs
Six Single Phase VCBs

25kV Standard PSV Configuration

25kV Nominal • I25 kV BIL • 3 Phase

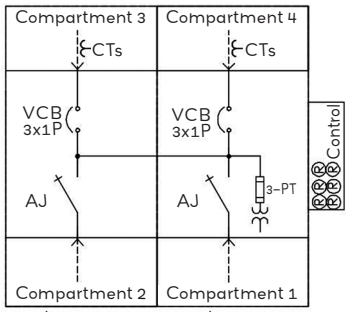
Circuit Diagrams with Compartment Numbers

Catalog No. 541144XX



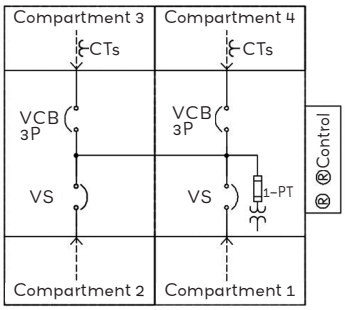
73-3/4" H x 84"W x 81-3/4"D
Two AJ Switches
Two Three Phase VCBs

Catalog No. 541155XX



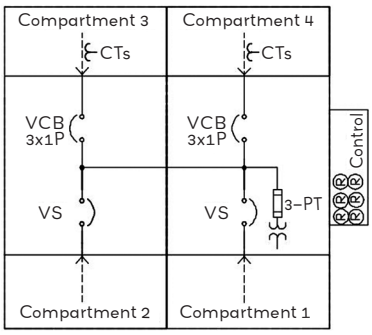
73-3/4" H x 84"W x 81-3/4"D
Two AJ Switches
Six Single Phase VCBs

Catalog No. 542244XX



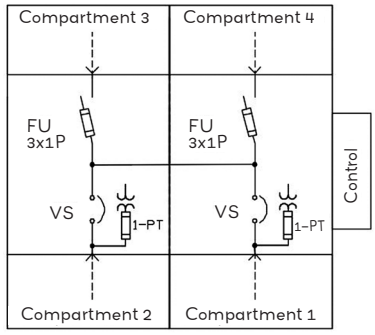
73-3/4" H x 84"W x 81-3/4"D
Two Three Phase VSs
Two Three Phase VCBs

Catalog No. 542255XX



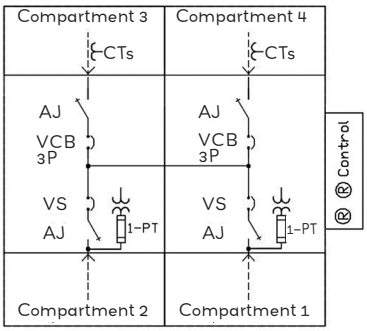
73-3/4" H x 84"W x 81-3/4"D
Two Three Phase VSs
Six Single Phase VCBs

Catalog No. 542288XX



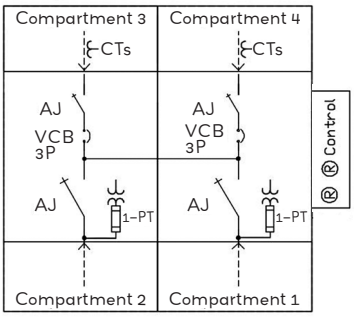
73-3/4" H x 84"W x 81-3/4"D
Two Three Phase VSs
Six Single Phase Power Fuses

Catalog No. 543366XX



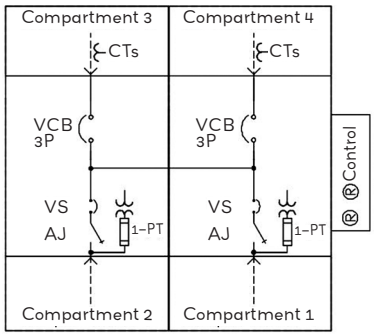
73-3/4" H x 84"W x 88-1/4"D
Two AJ Switches + Two 3-Phase VSs
Two AJ Switches + Two 3-Phase VCBs

Catalog No. 541166XX



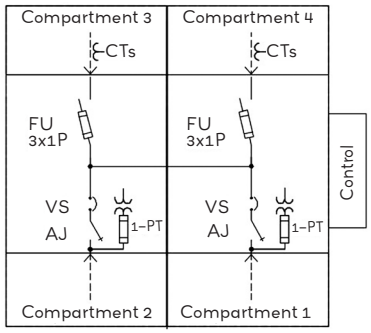
73-3/4" H x 84"W x 88-1/4"D
Two AJ Switches
Two AJ Switches + Two 3-Phase VCBs

Catalog No. 543344XX



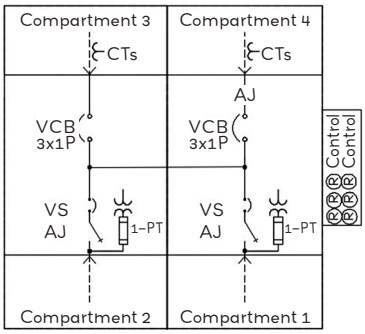
73-3/4" H x 84"W x 88-1/4"D
Two AJ Switches
Two 3-Phase VCBs

Catalog No. 543388XX



73-3/4" H x 84"W x 88-1/4"D
Two AJ Switches + Two 3-Phase VSs
Six Single Phase Power Fuses

Catalog No. 543355XX



73-3/4" H x 84"W x 88-1/4"D
Two AJ Switches + Two 3-Phase VSs
Six Single Phase VCBs

Automation Features of the PSV Switchgear

PSV SCADA ready vacuum switchgear is configurable with a variety of power handling and protection components. Each of the four ways in the gear can be one of seven devices, or a combination of devices, that can be selected to exactly match application needs. Auto-Jet® switches might be found in any compartment, but Vacuum Switches are usually found in source ways (compartments #I or #2), and vacuum circuit breakers and fuses are usually found in load side way (compartments #3 or #4).

- Auto-Jet® Switch (AJ)
- Vacuum Switch (VS)
- Auto-Jet® Switch plus Vacuum Switch (VS)
- Three Phase Vacuum Circuit Breaker (VCB)
- Three Single Phase Vacuum Circuit Breakers (VCBs)
- Auto-Jet® Switch plus Vacuum Circuit Breaker (VCB)
- Power Fuses (FU)

Vacuum Circuit Breakers and Auto-Jet® plus Vacuum Circuit Breakers

The Vacuum Circuit Breaker position is monitored by the SEL-85I relay. Vacuum Circuit Breakers can be switched locally, remotely with contact closure, or remotely through the local SEL-85I relay.

Note: When a manual Auto-Jet® Switch only is supplied with feeder protection provided by an SEL-85I relay, the SEL-85I will be used to monitor the position of the Auto-Jet® switch.

Vacuum Switch Ways and Auto-Jet® Plus Vacuum Switch Ways

The position of Vacuum Switch ways, and Auto-jet® plus Vacuum Switch Ways, are monitored constantly by local SEL-3505-3 RTAC device when an SEL-85I protection relay is not present in the assembly. Vacuum switches can be switched locally, remotely with contact closure, or remotely through the local SEL-3505-3 RTAC device.

Protection Assurance

Circuit Breaker protected way feature a “Protection Assurance” Feature. In the event of power loss, all vacuum circuit breakers (VCBs) can be made to open with loss of power, and VCBs do not reclose until protection is restored. The protective relays are voltage transformer powered.

Two modes of reclosing can be selected at set up:

I. Automatic- After power is restored and the protection relay is functional, the VCB will reclose. Using this method, the user is unaware that the VCB has been disconnected. But most importantly, the load circuit is NEVER added until the relay is completely functional. This is superior to CT powered relay products. CT powered relays will not function without sufficient current and do not offer short circuit protection until the relay “wakes up” with CT power. The Federal Pacific solution will not allow a VCB to close that does not have the ability to trip immediately. This solution allows Federal Pacific to offer "protection assurance" and communication before current flows without an uninterruptable power system (UPS) and the associated batteries that require service.

2. Manual- After power is lost and restored, an operator must close the VCB. This option can be selected when an automatic restart might create a harmful condition.

Low Voltage Compartment (applicable models only)

Low voltage controls are housed in an isolated eleven-gauge steel pad-lockable compartment. The compartment is ventilated top and bottom and fitted with a non-condensation space heater. The design features door-in-door construction for easy access.

First Door Open Revealing Door Mounted Equipment Used For Normal Operation

Second Door Open For Easy Service

Figure 6

A PSV low voltage compartment with optional meters and test switches.

Automation Features of the PSV Switchgear (continued)

Short Duration Disturbance Ride-Thru

In the event of power flicker lasting up to 3 cycles, the VCBs will not drop out. Circuit breakers are operated by DC voltage, and energy is stored to give protection for flicker disturbance protection.

Simplified Best Source Circuit

Using a simple solid state diode best source circuit, control power for the SEL protection relay is "Never" interrupted with loss of a single power source, when more than one control power source is in the assembly. In most applications, this will eliminate the need for an Uninterruptable Power Supply (UPS). When three single circuit breakers are employed, PTs monitor all three phases so that when power is available on any phase, relays are functional and communicating.

Relay Control Features

Relay Buttons: Trip push button and close push button

Relay Targets (Lights): Enabled, Trip, Inst OC, Phase OC, GRD OC, Breaker Fail

Relay Inputs: Remote contact closure for "Close", Remote contact closure for "Open", Auto-Reset Toggle (To select feeder reset), VCB or VS position contact (Available for comms), AJ position- as applicable (Available for comms), CM Controller health (Breaker Failure) (Available for comms)

Relay Output contacts: Close, Open, Auto-Reset On (Closed when reset is enabled)

Push Button: "Auto-Reset" Toggle Push Button

Pilot lights: Close, Open (Trip), Auto-Reset On (Illuminates when reset is enabled)

Commissioning and Start-Up, and Storage

One of the voltage inputs to the "Simplified Best Source" circuit is I20VAC external control using a common extension cord. At start-up, before medium voltage power is applied to the gear, I20VAC is supplied to the unit from an external source. This remote source energizes all the circuits allowing the user to set the trip level of all protected ways, verify all communication, and allows the "Manual/Automatic" selection of protected circuits.

If I20VAC is not available, each PSV is supplied with a I2VAC to I20VAC inverter in a door pocket. This can be plugged into a cigarette lighter, or attached directly to I2VDC battery power under the hood of a service vehicle.

This external I20VAC source is galvanically isolated from the switchgear power to prohibit any damage to the switchgear or the power source. Also, this AC power is not back fed onto medium voltage PTs, ensuring that only low voltage circuits are energized during start-up and commissioning.

When I2VDC external power is used, space heaters must be isolated to reduce control power load.

When the switchgear is stored outside for more than a few days, we recommend supplying power from an external source rated no less than I0 amp @ I20VAC to space heaters using the I20VAC receptacle.

Power Component for 15kV and 25kV Basic Units

Auto-Jet® Manual Load-Break Air Switches

Auto-jet® II Manual Load-Break Air Switch Ratings - Amps RMS					
Voltage Class	**Continuous Current**	**Load and Loop Switching**	**Short-Circuit Withstand Current (Sym.)***	**3-Time Fault-Close (Asym.)***	**Peak Withstand Current**
I5kV	600	600	I4,000	22,400	36,400
			25,000	40,000	65,000
25kV	600	600	I2,500	20,000	32,500
			25,000	40,000	65,000

*Three times fault close rating. The Auto-Jet® II switch can be closed into a fault of the magnitude specified three times and remain operable and able to carry and interrupt the rated current.

Power Fuses

When power fuses are selected, the PSV switchgear is provided with either SMU-20 or Eaton DBU fuses.

Nominal Voltage	**Fuse Manufacturer and Type**	**Unit Overall Ratings**		**Fuse Ratings**	
		Amperes RMS Short Circuit		**Amperes RMS**	
		Momentary ASYM	**MVA 3-Phase SYM**	**Max.**	**Interrupting SYM**
I4.4kV	S&C SMU-20	22,400	350	200	I4,000
	Eaton DBU	22,400	350	200	I4,000
25kV	S&C SMU-20	20,000	540	200	I2,500
	Eaton DBU	20,000	540	200	I2,500

Other fuses are available, consult factory for availability
SMU-20, or Eaton DBU, fused units require three Federal Pacific FP-3097 fuse end fittings and three S&C SMU-20, or Eaton DBU fuse units per fuse compartment.

15kV & 25kV Three Phase Vacuum Switches & Circuit Breakers
25kV Single Phase Circuit Breakers

PSV vacuum circuit breakers and vacuum switches are Tavrida Type LD. The Tavrida LD Series Circuit Breaker Modules are used extensively around the world and contain the most unique design elements of any MV breaker on the market. All components are assembled along a single axis, with three mono-stable magnetic actuators (one per pole). The actuators are mounted in a steel frame and are mechanically linked by a synchronizing shaft. The actuators drive a pulling insulator that, in turn, connects to the advanced Tavrida vacuum interrupters at the top of the breaker. This simple design results in the highest reliability available today. This breaker delivers a maintenance-free breaker with a life expectancy of up to 150,000 close-open operations. The CM_16 Control Module serves as the interface between the ISM_LD Circuit Breaker Module and relays and/or controls. The breaker meets standards IEC 62271-100, GB 1984-2003, and IEEE C 37.09.

Tavrida LD Circuit Breaker Ratings

Rated voltage (Ur), up to	15kV | 25kV
Rated continuous current (Ir)	800A | 800A
Rated power frequency withstand voltage (Ud)	36kV | 60kV
Rated lightning impulse withstand voltage (peak) (Up)	95kV | 125kV
Rated short-circuit breaking current (Isc)	20kA | 16kA
Rated peak withstand current (Ip, close and latch)	52kA | 42kA
Rated short-time withstand current, 4s (Ik)	20kA | 16kA
Rated frequency	50/60Hz |50/60Hz

15kV Single-Phase Circuit Breakers

PSV 15kV single-phase vacuum circuit breakers are Tavrida Type MD. The Tavrida MD Series Circuit Breaker Modules contain the most unique design elements of any MV breaker on the market. All components are assembled along a single axis, with three mono-stable magnetic actuators (one per pole). The actuators are mounted in a steel frame and are mechanically linked by a synchronizing shaft. The actuators drive a pulling insulator that, in turn, connects to the advanced Tavrida vacuum interrupters at the top of the breaker. This simple design results in the highest reliability available today. Tavrida delivers a maintenance-free breaker with a life expectancy of up to 30,000 close-open operations for three-phase circuit breakers and 50,000 close-open operations for single-pole breakers. The CM_16 Control Module serves as the interface between the ISM_MD Circuit Breaker Module and relays. The breaker meets standards IEC 62271-100, GB 1984-2003, and IEEE C 37.09.

Tavrida MD Circuit Breaker Ratings

Rated voltage (Ur), up to	15kV
Rated continuous current (Ir)	1250A
Rated power frequency withstand voltage (Ud)	36kV
Rated lightning impulse withstand voltage (peak) (Up)	95kV
Rated short-circuit breaking current (Isc)	31.5kA
Rated peak withstand current (Ip, close and latch)	82kA
Rated short-time withstand current, 4s (Ik)	31.5kA
Rated frequency	50/60Hz

Protection & Control Components for 15kV & 25kV Basic Units

Tavrida CM_16_1(220) VS and VCB Control Module

Every VCB and VS is fitted with a smart CM_I6 controller. The controller not only serves as a capacitor trip and close for the vacuum interrupters (VIs), but it also monitors the health of this PSV subsystem. If the vacuum interrupters cannot be tripped or closed by the CM_I6, the CM_I6 will alarm. This also includes any form of CM_I6 disconnection from the vacuum interrupter (VI). The CM_I6 needs only dry isolated contact closure to trip and close the VIs.

Control Module Ratings	
Rated Operating Sequence	O-0.3s-CO-I0s-CO-I0s-CO
Auxiliary Power Supply	85VDC to 370VDC, or 85VAC to 275VAC
Power Consumption	Less than 42W charging, 7W standby

Control Module

SEL-85I Protection Relay

SEL-851 Protection Relay

The PSV switchgear default relay selection is the SEL-85I. The SEL-85I is a small form factor protection and monitoring device, that also offers plenty of control and communication capability for integration into smart distribution systems. SEL Grid Configurator software is used to easily set up the relay.

SEL-85I Protection Elements include*: 50P Phase Overcurrent, 50Neg Neg.-Seq. Overcurrent, 50Gnd Residual Ground Overcurrent, 50N Neutral Overcurrent, 50ABC Per-Phase Overcurrent, 5IP Phase Time Overcurrent, 5IGnd Residual Ground Time Overcurrent, 5INeg Neg.-Seq. Time Overcurrent, 5IN Neutral Time Overcurrent, HBlk Second-Harmonic Blocking, 27 Undervoltage (Phase-to-Phase), 59 Overvoltage (Phase-to-Phase, Residual), 60LOP Loss of Potential, 32 Directional Power, 55 Power Factor, 8I Over- and Under frequency, BF Breaker Failure, 79 Reclosing, AFD Arc-Flash Detection.

*Protection element availability depends on the relay selected and the configuration of the gear. Consult the factory for details.

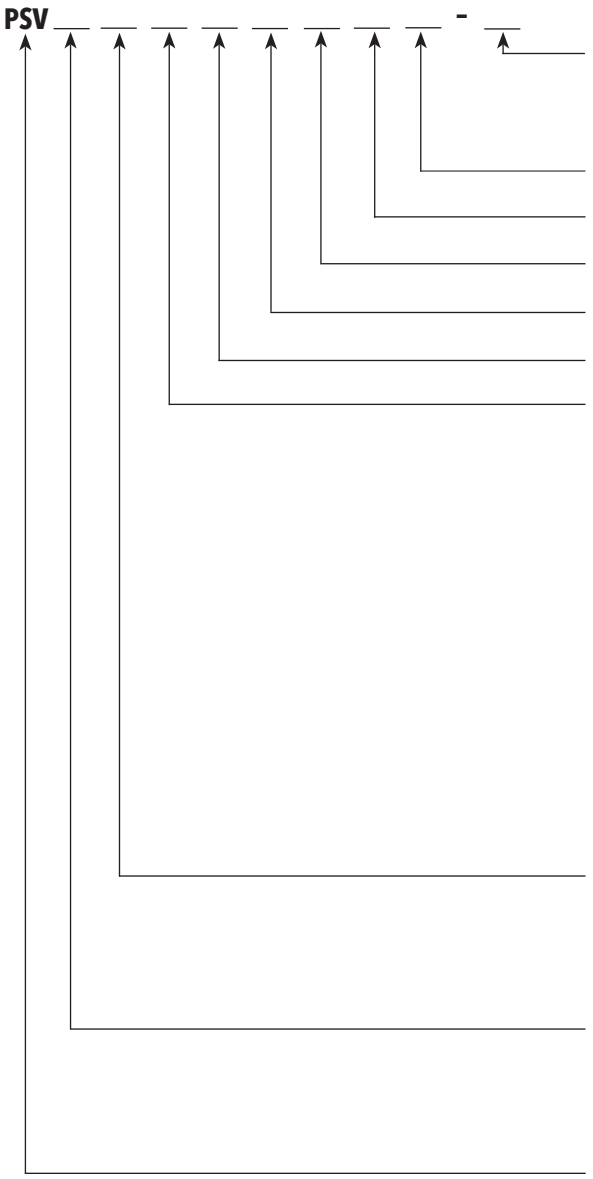
SEL-85I relays can be provided in PSV gear with Ethernet, serial, USB-C ports. SEL-85I also offers an Integrated WEB server. Communication protocols include Modbus TCP, Modbus serial, DNP3 LAN/WAN, DNP3, MIRRORED BITS communications and IEC 6I850 Edition 2, SNTP, FTP, HTTP/HTTPS, and SEL.

When present in a PSV configuration the SEL-85I relay will serve the function of monitoring auto-jet and vacuum switch positions, remote control of vacuum switches, and communication.

Power Inverter

Every PSV switchgear fitted with an SEL-85I relay is supplied with a 400W, or higher, I2VDC to I20VAC power inverter. For set-up and commissioning, a I20VAC male outlet is available for a remote power supply. If I20VAC is not available at installation, the power inverter can be used to convert power from a cigarette lighter, or I2VDC battery terminals, for relay set-up on site. Caution, when using the power inverter, make sure space heaters are not selected. The inverter can't supply this load.

PSV Configured Number Designations



Optional Features
(See following page or Optional Features)

Device(s) for Compartment Six - see Device Option(s) Below

Device(s) for Compartment Five - see Device Option(s) Below

Device(s) for Compartment Four - see Device Option(s) Below

Device(s) for Compartment Three - see Device Option(s) Below

Device(s) for Compartment Two - see Device Option(s) Below

Device(s) for Compartment One - see Device Option(s) Below

Device Options for Compartments One through Six Above

1 - Load Break Switch (Autojet)
2 - Three Phase Vacuum Switch
3 - Load Break Switch (Autojet) + Three Phase Gang Operated Vacuum Switch
4 - Three Phase Gang Operated Vacuum Switch
5 - Three Single Phase Vacuum Circuit Breakers
6 - Load Break Switch (Autojet) + Three Phase Gang Operated Vacuum Circuit Breaker
7 - Load Break Switch (Autojet) + Three Single Phase Vacuum Circuit Breakers
8 - Three Fuses, Individually Removable
9 - Tap Way
0 - Blank (Empty)
X - Not Applicable

Number of Compartments

4 - Four Compartments
5 - Five Compartments
6 - Six Compartments

Voltage Class

4 - 15kV Class
5 - 25kV Class

Equipment Type

PSV - Automatic Dead-Front Pad-Mounted Switchgear

PSV Configured Number Example

PSV 4 4 1 1 4 4 X X - A2

Description:

Type PSV Automatic Dead-Front Pad-Mounted Switchgear, 15kV, 4 compartments.
Compartment One - Loadbreak Switch (Autojet).
Compartment Two - Loadbreak Switch (Autojet).
Compartment Three - Three Phase Gang Operated Vacuum Circuit Breaker.
Compartment Four - Three Phase Gang Operated Vacuum Circuit Breaker.
Six inch, Mild Steel, Non-Compartmented Base Spacer.

Optional Features

BASE SPACER — MILD STEEL
Non-compartmented (Applicable to all models)

A2 .....6" to increase cable terminating height
A3 ..... I2" to increase cable terminating height
A4 ..... I8" to increase cable terminating height
A5 ..... 24" to increase cable terminating height

Compartmented (Applicable to all models)

A6 .....6" to increase cable terminating height
A7 ..... I2" to increase cable terminating height
A8 ..... I8" to increase cable terminating height
A9 ..... 24" to increase cable terminating height

BASE SPACER — STAINLESS STEEL
Non-compartmented (Applicable to all models)

AS2.....6" to increase cable terminating height
AS3 ..... I2" to increase cable terminating height
AS4 ..... I8" to increase cable terminating height
AS5 ..... 24" to increase cable terminating height

Compartmented (Applicable to all models)

AS6.....6" to increase cable terminating height
AS7 ..... I2" to increase cable terminating height
AS8 ..... I8" to increase cable terminating height
AS9 ..... 24" to increase cable terminating height

BASE ADAPTERS

To order base adapters for PSV switchgear (typically when replacing equivalent PSI/II switchgear, or competitor's switchgear with similar footprints), add "99" to the equivalent base spacer shown above.

Examples:

AS2 = 6" Stainless Steel Base Spacer.
AS299 = 6" Stainless Steel Base Adapter.

BUS

C Copper Bus (main and all termination points)

BUSHING OPTIONS

DB Dual Bushings
LBI Loadbreak Inserts

FUSE STORAGE HOOKS

Hooks to hang three complete fuse assemblies on

E3 Compartments 3 & 4

NOTE: Fuse storage hooks may not be installed on doors with K3 or K4 interlocks.

FINISH COLOR & SPECIAL CABINET MATERIAL

F2 ANSI #6I light gray
F3 ANSI #70 sky gray
F4 Type 304 stainless-steel cabinet (exterior only)
F5 Coal Tar coating on lower three inches of enclosure or optional base spacer
F6 All Type 304 Stainless-Steel Cabinet and internal parts (or non-ferrous) hardware, except switch frame and all current-carrying parts.
F7 Same as F6 with the addition of an all stainless-steel Auto-Jet switch (except current carrying parts). This is rarely necessary for most dead-front applications due to the protection afforded by the medium voltage compartment.

Consult the factory for other colors.

KEY INTERLOCKS AND SECURITY BOLTS

Name of ultimate user, installation number and location of pad-mounted switchgear required with order.

CABLE SUPPORTS (Includes cable brackets)

Cable supports are recommended for cables 350 MCM or larger and for all parallel cable applications.

T3 One for each switch terminal and bus terminal, accommodating #2 through I000 kc mil conductor. Applicable to all models.
T4 One for each fuse terminal accommodating #2 through 4/0 conductor. Applicable to all models with fuse positions.
Cable supports extend below the base of the unit, and require the use of a cable pit or specify a minimum of I2" base spacer.

Pad Recommendations

I) The generic (or top-level) drawings show the recommended positioning for the incoming cables at the switch and fuse terminations, as appropriate, along with the footprint of the switchgear.
2) The use of box pads (or equivalent) with a cable chamber or "pit" is recommended for maximum flexibility in cable installation and management.
3) Full or slotted openings are especially desirable for slab-on-grade installations which do not have a cable chamber or pit.

The following pad construction techniques have proven problematic and <u>are not recommended</u>:

<u>Embedded ducts</u> in poured concrete slab-on-grade installations, when the ducts are not installed in the recommended locations.

<u>A single duct</u> in slab-on-grade construction for multiple phases, especially if the duct extends any appreciable distance above the pad-top.

<u>Note</u> –Some of these issues may be alleviated by installing a base spacer. Contact the factory for details if needed.

FAULT INDICATOR PROVISIONS

T6 Mounting provisions only. To accommodate one three-phase fault indicator in each switch compartment. Consult factory for suitability.

T7 Mounting provisions only with viewing window, to accommodate one three-phase fault indicator in each switch compartment with fault indicator viewing window on associated door. Consult factory for suitability.

For LED-Type Fault Indicators and other special options, consult the factory.

Notes:

Notes:

Electro-Mechanical Overview

Electro-Mechanical is an American-owned company founded in 1958. It is headquartered in Bristol, Virginia (USA) and for more than 60 years has manufactured a wide variety of products used in the generation, transmission, distribution and control of electricity. These products, along with various electrical equipment repair and maintenance services, are used by a diverse mix of Energy (coal, oil and gas), Electric Utility and Industrial customers worldwide. Federal Pacific medium voltage metering, collector, and gird connection gear for the renewable markets is offered under the GridConnex® trade name.

Electro-Mechanical has earned a "customer oriented" reputation by keeping its focus on providing the best value to its customers through quality products and services. With six manufacturing companies and two repair and service companies, Electro-Mechanical has over 650,000 square feet of modern manufacturing facilities, located in Virginia and Mexico.

Electro-Mechanical consists of:

Federal Pacific - Dry-type transformers from .050 KVA through 10,000 KVA single and three phase, up to 25 kV, 110 kV BIL with UL® approval through 15 kV; Vacuum pressure impregnation and vacuum pressure encapsulation. Medium voltage switchgear including air-insulated live-front, dead-front, SCADA-controlled, automatic transfer, primary metering and wall-mounted pad-mounted and metal-enclosed switchgear. The quality systems of Federal Pacific have been certified by DQS Inc. to the ISO 9001:2015 Standard.

Line Power Manufacturing - Custom engineered electrical distribution and control apparatus including low and medium voltage metal-enclosed switchgear, power control centers, motor controls, and substations. Electrical power distribution systems and components used in mining. The quality systems of Line Power have been certified by DQS Inc. to the ISO 9001:2015 Standard.

Federal Pacific

MAFESA - Electro-Mechanical's manufacturing facility in Mexico for stock low-voltage transformers.

Engineered Solutions - Innovative engineered solutions are offered by Federal Pacific and Line Power meeting specific customer application needs. Products include custom medium voltage switchgear serving data centers and renewable energy, switchgear value propositions, and portable substations.

Line Power Manufacturing

Line Power Parts & Rebuild - New parts, complete electrical equipment remanufacturing and onsite electrical equipment service. The parts service department provides replacement components manufactured by Electrical Group companies as well as commonly used OEM parts.

Mirus International, Inc. - Designs and develops world class power quality improvement products for mission critical operations. Our specialized product line includes highly efficient harmonic filters, transformers, autotransformers and Data Center power distribution equipment. Mirus' solutions minimize disruption to the power supply, improve reliability and adhere to the strictest of regulatory requirements while also saving energy and reducing operating costs.

Mirus International

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FP-PSV-05/2023

The quality systems of Federal Pacific have been certified by DQS Inc. to the ISO 9001:2015 Standard

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