

TYPE PSI/II PAD-MOUNT SWITCHGEAR with Non-Loadbreak Fuse Mountings 15kV • 25kV INSTRUCTIONS For Installation and Operation

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The PSI Pad-mount is a family of switchgear with the second generation PSI/II being smaller in size for mounting on industry accepted pads and vaults. All units use the same fully tested and field proven load interrupter switch.

Qualified Persons

⚠ WARNING

The equipment covered by this publication must be selected for a specific application and it must be operated and maintained by **Qualified Persons** who are thoroughly trained and knowledgeable in the installation, operation, and maintenance of underground power distribution equipment along with the associated hazards that may be involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. Proper installation is the responsibility of the operating and construction personnel and the utility performing and authorizing the work. Completion of these instructions implies no further warranty by the manufacturer.

A **Qualified Person** is defined in the National Electrical Code (NEC/NFPA-70) as:

One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

The specific electrical safety training requirements to be considered a qualified person are detailed in **NFPA-70E, Article 110.1(D), Employee Training**. Some of the requirements from the 2012 edition are shown below. For the specific detailed training requirements for a Qualified Person make certain to refer to the most recent applicable edition.

These training requirements would include, but are not limited, to the following key points:

- The skills and techniques necessary to distinguish exposed energized parts from other parts of electrical equipment.
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed.
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment.
- Tasks performed less often than once per year have additional training requirements.

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. Additionally, the recommendations in this instruction bulletin are not intended to supersede or to take the place of established utility safety guidelines and established practices. If there is any question, consult with your foreman or supervisor, as appropriate.

Please refer to OSHA 29 CFR 1910.399 and NFPA 70E Articles 100 and 110.

SAFETY INFORMATION

Understanding Safety-Alert Messages

There are several types of safety-alert messages which may appear throughout this instruction bulletin as well as on labels attached to the padmounted switchgear. Familiarize yourself with these types of messages and the importance of the various signal words, as explained below.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

SAFETY INSTRUCTIONS

Safety Instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

FOLLOWING SAFETY INSTRUCTIONS

NOTICE



Thoroughly and carefully read this instruction bulletin before installation of the pad-mounted switchgear, before operating the switches or before operating the fuse mountings in this equipment, and before performing any maintenance on the equipment.

SAFETY PRECAUTION

DANGER

Federal Pacific Fuse Mountings in conjunction with appropriate fuses are designed to protect equipment and to disconnect faulted equipment from the system. The fuses cannot protect personnel from injury or electrocution if contact is made with energized circuits or hardware.

If you do not understand any portion of this instruction bulletin and need assistance, contact Federal Pacific at 276-466-8200.

Replacement Instructions & Labels

If you need additional copies of this instruction bulletin, contact Federal Pacific at 276-466-8200.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting Federal Pacific.

Introduction

Type PSI/II pad-mounted switchgear with SM-5S Power Fuses is designed to make installation, operation and maintenance as simple as possible and to provide dependable on-the-line service.

High quality materials and careful workmanship have been combined to provide the best switchgear available. The switchgear has been thoroughly inspected and adjusted at the factory. However, successful operation depends on proper installation and care.

This manual has been written to assist you in obtaining long and economical service from your switchgear.

Read this manual before installing and operating your switchgear.

Receiving

Upon receipt of the switchgear, check each item received for shipping damage. Each item should be checked against the shipping manifest to assure that the proper number of items were received. Should any shortage or damage exist, a claim must be filed at once with the carrier, and the Federal Pacific agent or sales office must be notified.

Handling

The switchgear is securely mounted to a sturdy shipping pallet with provisions for forklift use in removing the unit from a truck. The forklift truck used must have the proper lifting capacity and the forks must extend completely through the skid to avoid damaging the equipment.

Removable lifting plates are provided to allow the use of hooks to lift the complete enclosure. The lifting device should be arranged to evenly distribute the lifting force between the lifting plates.

CAUTION

Do not lift at an angle less than 60 ° from the horizontal. See Figure 1. Failure to comply with this requirement may result in damage to the equipment.

Storage

The switchgear as received may be wrapped in a protective plastic film.

NOTICE

If the switchgear is not to be installed immediately, the protective film **must** be removed for outdoor storage of unit.

Export or special packing is available as an option based on customer's requirements and special conditions. Separate instructions are available for these situations.

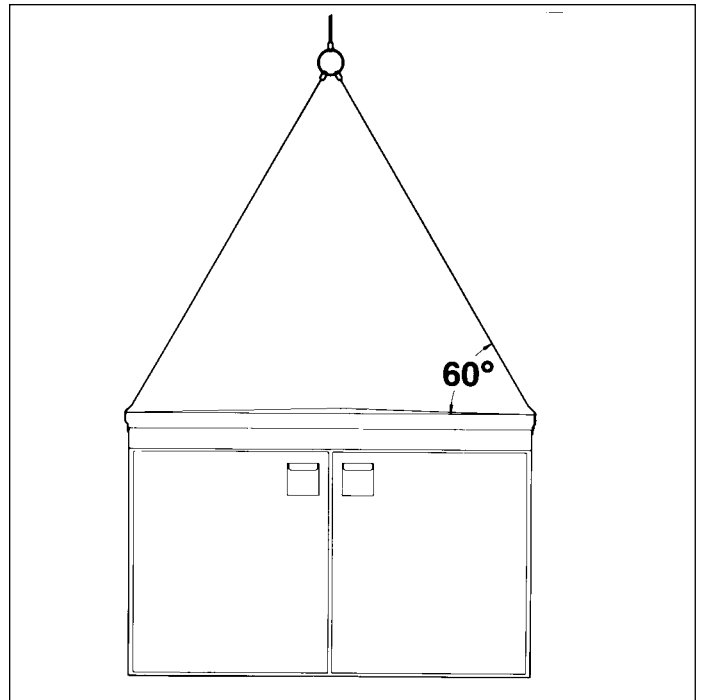


Figure 1. Lifting Method

General Description

Type PSI/II pad-mounted switchgear typically consists of one or more three-pole, single-throw, gang-operated, quick-make, quick-break, load interrupter switches in combination with one, two or three 3-phase sets of fuses equipped with integral load interrupter for single-pole switching. When used in conjunction with power fuses, expulsion or current-limiting type, and other protective devices, the PSI/II switchgear provides a safe and efficient means of 3-pole switching and circuit protection.

Security Features

Type PSI/II padmounted switchgear incorporates a number of security features to minimize hazards to operating personnel.

1. Rugged 11-gauge steel, all welded construction of the enclosure, roof, and doors assures a tamper-resistant design.
2. Padlockable switch operating pocket handles and doors with security bolts provide user-controlled access.
3. Switch position indicators positively verify switch position.
4. Provisions to padlock switch in open or closed position permit user controlled switch operation. (Optional)
5. Key interlock to ensure a predetermined sequence of mechanical operations. (Optional)
6. Warning signs and labels, both external and internal, which indicate potential hazards to personnel.

NOTICE

Do not use power tools to operate the security bolt.

Door System

The automatic door latching feature furnished on the main doors provides ease in opening and closing of the doors.

Auto-Latch Features

Features of the Auto-latch system are:

- Automatic 3-point latching upon door closure. See Figure 2.
- After unlatching on opening, the door is automatically set for latching upon door closure.
- Unlatching is only accomplished by rotation (in either direction) of a captive pentahead (or hexhead) actuator bolt through an arc of approximately 60 degrees.
- The door padlocking provision prevents unlatching the mechanism until the padlock has been removed. Padlocking also secures the door to the cabinet enclosure.
- A stainless steel protective cover guards the padlock from tampering. Also, access and visibility to the actuator bolt is only possible after the padlock has been removed.
- A closed, latched, Auto-latch door can successfully withstand a "pull" greater than 600 lbs. at any point on the door.



Figure 2. Auto-latch mechanism with 3-point latching on door closure.

Auto-Latch Operation

Opening:

1. Remove padlock and raise protective cover exposing security bolt. See Figure 3.
2. Using a standard 3/4 inch socket for hexhead security bolt or standard pentahead socket for pentahead security bolt, rotate the captive actuator bolt head in either direction until latching mechanism has tripped. See Figure 4. Do not use power tools to operate the security bolt.
3. Open door and secure with door keeper.

Closing:

1. Replace or release door keeper and close door with a firm brisk push. Mechanism will automatically latch.
2. Install padlock through protective cover tab and enclosure tab.



Figure 3. After removing padlock, raise cover to access security bolt.



Figure 4. Use standard pentahead socket (or hexhead socket if optional hexhead bolt is specified) to turn bolt. Rotate security bolt clockwise or counter-clockwise to release three-point latch and charge for subsequent door closing. Do not use power tools to operate the security bolt.

Installation

Each unit is shipped with this instruction bulletin which will be located inside the switch compartment door. These instructions should be reviewed prior to placing unit on pad.

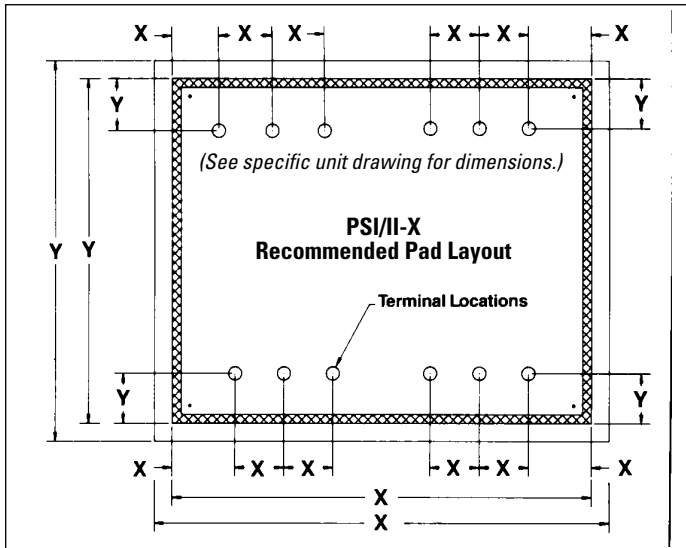


Figure 5. Typical Pad Layout

NOTICE

Installer shall provide appropriate clear working space, as required by applicable codes and/or work practices, to allow installation, operation, inspection, and maintenance of the switchgear.

Placement of Unit

Remove unit from shipping pallet per handling procedures of Page 3 (Figure 1). When unit has been correctly oriented and placed on pad (Figure 5), verify that unit is level and shim if necessary between unit base and pad. Secure unit to pad using four (4) tie-down clips as furnished (see Figures 6 and 7). Check compartment door operation for any binding due to enclosure distortion and re-shim if necessary. A recessed grouting should then be applied between unit base and pad to prevent entry of foreign objects.

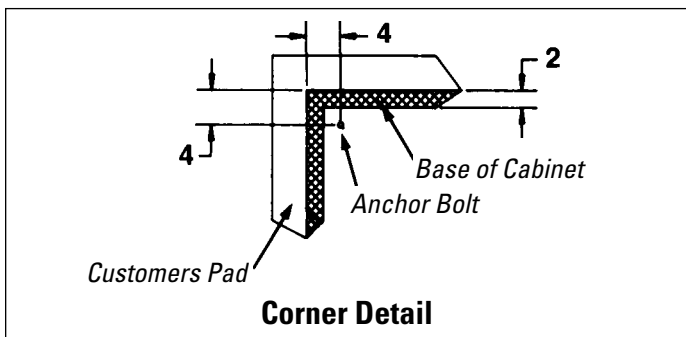


Figure 6. Typical Anchor Bolt Location

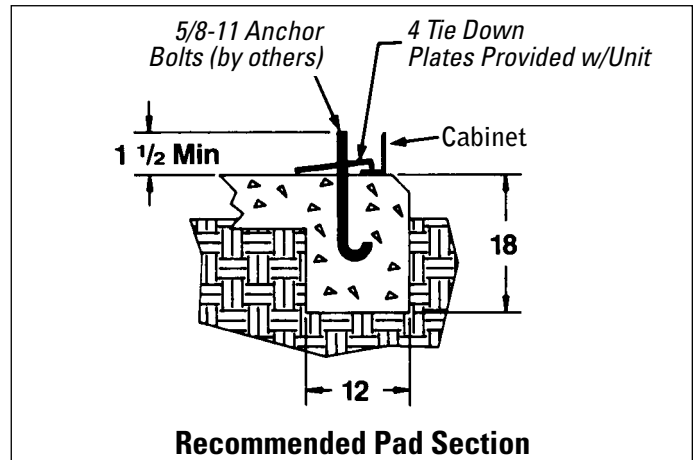


Figure 7. Bolting Units to Pad

WARNING

When removing barriers, care must be taken to keep the barrier clean and dry. Contamination on barrier can lead to tracking and arcing. Clean off any contamination with a non-alcoholic cleaner that does not leave any residue.

Barrier Removal

The use of interphase, phase-to-ground, dual-purpose front barriers and dead-front hinged barriers enhances the operation of pad-mounted switchgear by field personnel. The standard barrier system for type PSI/II pad-mounted switchgear includes removable interphase barriers which maintain all the features of a fixed barrier system while allowing removal of phase-to-phase barriers from both the switch and fuse compartments during cable termination when the switchgear is de-energized.

Removal of the barriers is readily accomplished as follows:

1. Completely disconnect the unit from all power sources.
2. Open main door (see Door System on page 4) and secure with door keeper.
3. Test for voltage, and ground the unit before barrier removal is attempted.
4. Remove the dual-purpose barriers from their normal hanging position. If the optional B4/B5 barrier is provided, it must be unbolted and secured open before dual-purpose barriers may be accessed (see page 6).
5. Grasp center of interphase barriers. With lifting and pulling up action, remove barriers from switch (see page 6). See Figure 8.
6. Barriers may be reinstalled by grasping the top and center of barrier, placing in front guide slots and inserting barrier through front slots into rear guides.
7. Dual-purpose barriers may then be reinstalled.



Figure 8. Switch and fuse side removable barriers facilitate cable installation and termination when the switchgear is de-energized. Fuse side is shown. Lift up until rivets on barrier align with slot in top front barrier guide, and pull out to remove barriers.

The optional B4/B5 hinged barrier is provided to meet the requirements of section 381-G of the National Electrical Safety Code. The B4/B5 barrier (if provided) may be opened and secured as follows:

1. Disengage the security bolts that secure the B4/B5 barriers. See Figure 9.
2. Pivot the hinged barrier open. Secure the barrier open by sliding the pin on the enclosure-door tab into the clip on the top edge of the barrier. See Figure 10.
3. B4/B5 barrier may be closed and secured by reversing the steps above.

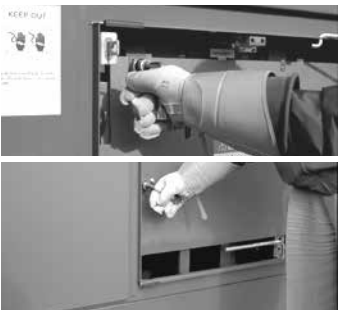


Figure 9. Disengage barrier security bolt.

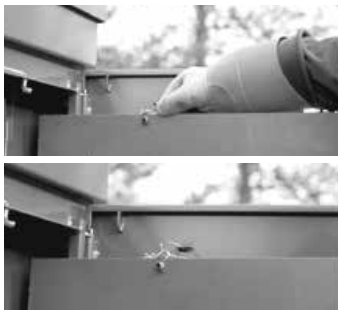


Figure 10. Secure barrier open.

⚠ WARNING

Failure to observe the electrical clearances specified in the table and illustrated in the diagrams on page 11 may result in electrical arc damage, personal injury or death.

Customer Cable Connections

With removable barriers removed, customer cables may be easily terminated per the following procedures:

1. The hanging weight of the primary cables must not be allowed to place undue strain on the switch/fuse termination bus. Should this situation exist, cable supports must be used. The mounting holes in the switch/fuse termination bus and the cable connector must align to prevent undue strain.
2. Make up the primary cable connections per user URD operating procedures, cable manufacturer instructions, and cable terminator manufacturer instructions.

⚠ CAUTION

When terminating cables, ensure that each cable termination connector lays flat against the corresponding switch or fuse terminal, so that no additional strain is put on the terminal and the corresponding bolt holes are in alignment. The connecting bolts are not to be used to pull the cable terminations into alignment with the terminals.

3. Remove surface oxides and coat both surfaces with suitable joint compound (required only when unplated aluminum connectors are used).
4. Attach cable connector to the switch/fuse termination bus using 1/2-inch hardware as shown in Figure 11. Nominal torque of 45 ft. lbs. should be applied on metal-to-metal surfaces.
5. Connect the concentric neutral wires and enclosure grounding pads inside enclosure to establish a ground system conforming to user's standard grounding practices.

⚠ WARNING

The maximum momentary rating of the switchgear must be considered when selecting cable size for connecting switchgear to system ground. Refer to unit rating plate.

6. Install and connect surge arresters or fault indicators, if applicable.
7. Install barriers. (See section on barrier removal on page 5).

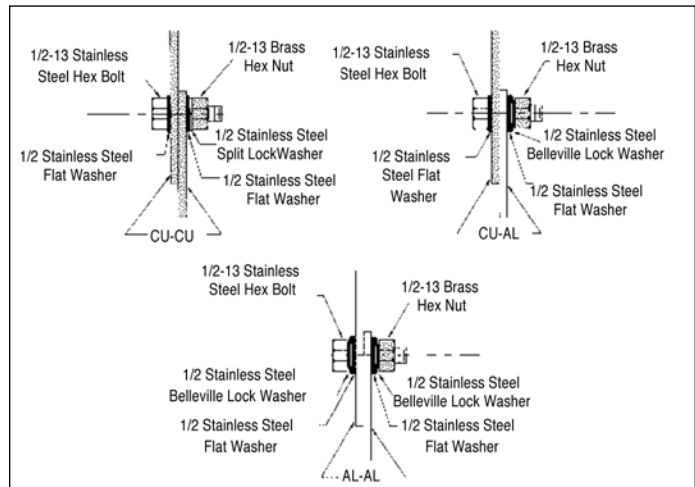


Figure 11. Hardware for termination connection

Switch Description

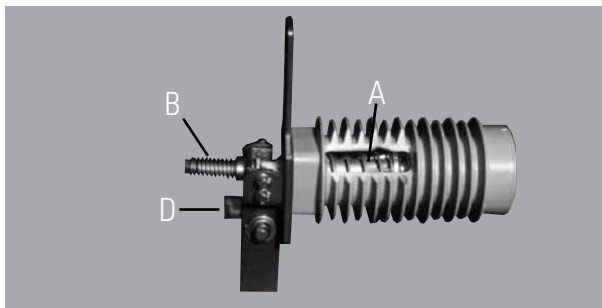
The Auto-jet® II switch provides a unique method of load interruption, producing a laminated jet of air which extinguishes the arc.

Auto-jet® II switches have a heavy gauge steel, all welded base frame that assures proper alignment and eliminates any problem of switch-to-enclosure alignment. A quick-make, quick-break stored energy mechanism with heavy duty, long-life die springs provides high-speed opening and closing independent of the operating handle speed. This durable mechanism assures safe load make, 3-time fault closing capability, and load interruption with the Auto-jet® interrupter.

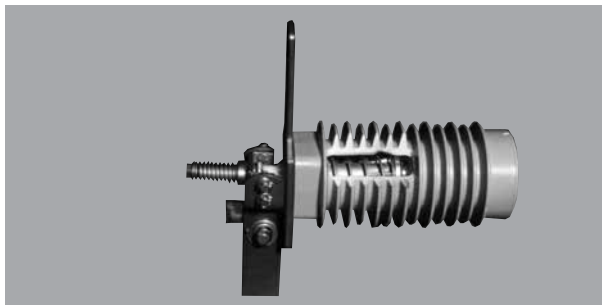
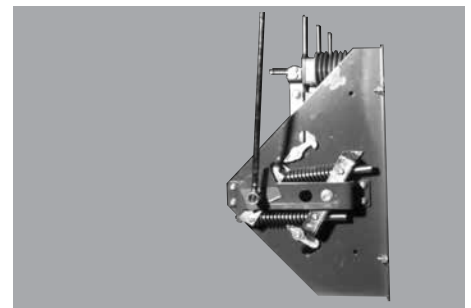
Interrupter Operation

The Auto-jet® interrupter consists of a piston (A) mounted in the cavity of the upper insulator. The movable arcing probe (B) engages a tulip contact (C) inside the piston. As the switch blade is pulled open by the stored energy mechanism, the main contacts (D) separate. The piston is pulled forward by means of the movable arcing probe, which compresses a heavy gauge spring encircling the piston and a spring encircling the arcing probe. At the end of its travel, the piston separates from the arcing probe

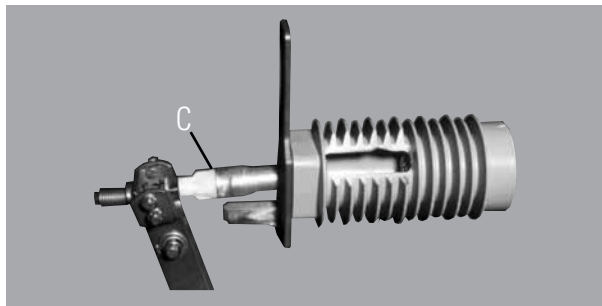
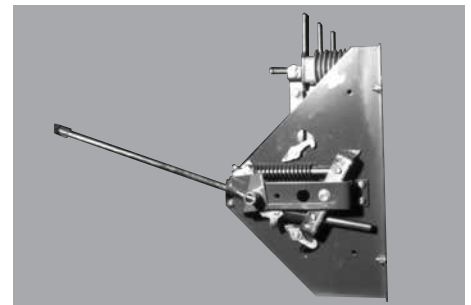
and, under the action of the heavy spring, is rapidly pushed backward into the cavity. This travel produces a jet of laminated compressed air up through the hollow center of the piston, which extinguishes the arc. The spring encircling the movable arcing probe rapidly retracts the probe and increases the speed of separation, which prevents restriking.



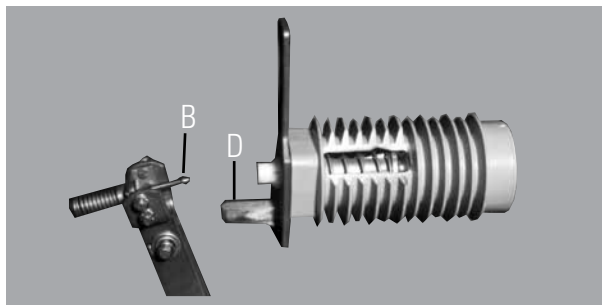
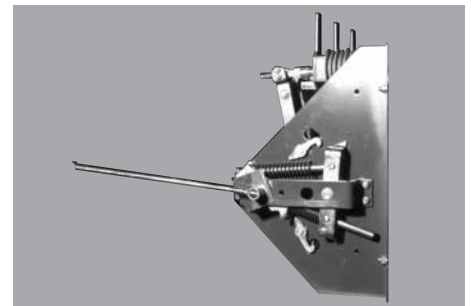
Switch closed with opening spring relaxed.



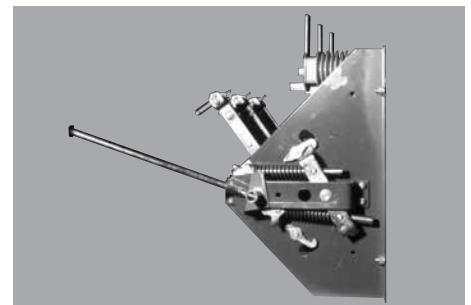
Switch closed with opening spring charged by manual operating handle.



Main contacts parted, puffer and arcing springs charged. (Simulated condition for illustrative purposes, actual duration of event is approx. 1/2 cycle.)



Switch open with latch engaged to hold switch in position.



SWITCH RATINGS

Nom.	KVA			Amperes, RMS			Mom & Fault-Close (ASYM KA)	Fault-Close Duty Cycle*
	Max. Des.	BIL	Cont.	Interrupting				
				Load	Cap	Mag.		
15	17	95	600	600	100	21	40	3
25	27	125	600	600	100	21	40	3

*The three time duty-cycle fault-closing rating means that the switch can be closed three times into rated fault amperes and remain operable and able to carry and interrupt its rated load current.

⚠ WARNING

To avoid exposure to potential arcing conditions, it is recommended that all switching operations with the Auto-jet® switch be performed with all barriers in place and with all enclosure doors closed and latched.

Operating the Auto-Jet® II Switch

1. Remove padlock and open the switch operating pocket access cover. See Figure 13.
2. Remove switch operating handle from storage clips (Figure 14) and fold out, sliding clip over the joint of the two handle sections to secure the handle in its extended position. Place the handle on the hex switch-operating shaft (Figure 15). If provision to padlock switch in open or closed position is provided (K2 option), padlock must be removed before access to hex switch-operating shaft can be accomplished.

If optional key interlock(s) are provided, switch may be locked in the open position.
3. Rotate handle in the direction as indicated to open or close switch. Verify switch position by observing the switch position indicator. See Figure 15.
4. Remove handle and return to handle storage tube.
5. Close switch operating pocket access cover (Figure 16) and padlock.

⚠ CAUTION

Access cover should be padlocked whenever switchgear is left unattended.

⚠ CAUTION

The standard barrier system provides dual-purpose barriers for insertion into the open gap when switch is in the open position (Figure 17). Should an attempt be made to close the switch with the DP barriers in the inserted position, the DP barriers will prevent the switch blades from closing (Figure 18). Should this occur, turn the switch handle briskly in the direction required to open the switch. The switch mechanism will re-latch and after the DP barriers are removed and returned to the hanging position, the switch may be closed in the normal manner.

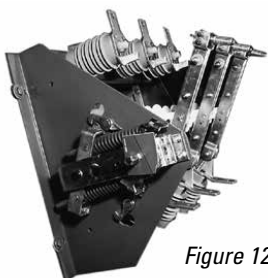


Figure 12. 15kV Auto-jet® II Switch.

⚠ WARNING

In the event the mechanism did not latch, wearing full personal protective equipment (PPE) and clothing, open the switch compartment door, using a grappler tool installed on a universal pole, insert the grappler prong into the barrier ring and pull the barrier out of the gear.

It may be necessary to drive back the mechanism to release the blade pressure on the barrier.

After the barrier has been removed, while taking the switch handle to the full extent of the desired position, a second operator should use the grappler tool to push the switch blade the rest of the way to the desired position. Once this is accomplished, the grappler tool should be removed, and then the force let off of the switch handle.

⚠ WARNING

Dual-Purpose Barriers should not be left in the slide-in position for more than one week. Accumulation of contamination on the barrier may cause tracking that can ultimately lead to a flashover. Clean any contaminated barrier per "Maintenance" instructions on page 13.

Figure 13. Remove padlock and open door.



Figure 14. Remove handle. (Handle is attached by a cable.)



Figure 15. Rotate handle in direction as indicated.



Figure 16. Exterior view showing switch operating pocket access cover.



Figure 17. Switch DP barrier shown in normal hanging position.



Figure 18. Switch DP barrier in slide-in position.

Fuse Descriptions

The SM-5 fuse mounting is a non-loadbreak device and requires that fuses be de-energized before opening the fuse. Failure to de-energize the fuse before opening will create an arc, which may cause serious injury or death.

DANGER

DO NOT open fuses while carrying load current. The fuse mountings are NON-LOADBREAK type and must not be opened until all load current is removed.

Failure to remove all load current prior to opening these fuses may result in serious injury or death!

The SM-5S fuse mounting includes a latch at the upper end and a cast hinge with guide surfaces on the inner surfaces to provide positive self-guiding action for the holder during opening or closing.

Precautions for Non-Loadbreak Fuse Operation

When non-loadbreak style fuse mountings are furnished, such as the S&C SM-5S Power Fuses or the clip style mountings to accommodate Cooper (McGraw-Edison) Type NX and Kearney Type Q no loadbreak switching with fuses is possible. The fuse replacement procedure is described in the section entitled "Non-Loadbreak Fuse Operation". Furthermore, the following precautions must be observed when work is performed on non-loadbreak fuses:

1. All upstream devices which could energize the fuse must be opened and rendered inoperative to remove possibility of inadvertently energizing the fuse.
2. Upon opening the fuse compartment door, the equipment should be tested for the presence of voltage using a suitable voltage sensing device and hotstick arrangement.
3. If no voltage is present, the appropriate fuse terminal should be grounded using proper grounding techniques and devices.
4. Fuse(s) may then be removed and replaced using the user's appropriate standard fuse replacement procedures.

Non-Loadbreak Fuse Operation

1. Open all switches in the unit. If furnished with key interlocks (option suffixes -K2 and K3), remove key from interlock and insert and turn in key interlock tumbler on fuse-compartment door to gain access to fuses.
2. Open appropriate fuse compartment door and secure.
3. Remove optional B4/B5 inner door barrier, if applicable. Remove optional B2 fuse dual-purpose barrier, if applicable, permitting access to desired fuse. The dual-purpose barrier may be removed using universal pole and grapples tool arrangements. See Figure 16.
4. Install grapples tool into pull ring of fuse end fitting.

5. Pull the fuse open with one swift, non-hesitating motion to fully open position (45°). Maintain downward force on fuse pull-ring until fuse opening motion has ceased to prevent tendency for fuse to bounce toward the closed position. See Figure 20.

CAUTION

Do not assume that an open fuse position indicates the fuse to be de-energized.

For opening or closing operations and for fuse handling and replacement, refer to the applicable instruction sheet supplied by the fuse manufacturer. For S&C SM-5S Power Fuses, refer to S&C Instruction Sheet 252-506. For instructions on installing SM-5 fuse refill units, refer to the instruction sheet furnished with each refill unit.

6. Use an extra-large clamp (similar to Hastings Universal Extra-Large Adjustable Fuse Puller, Cat. No. 5455-93) secured to a Universal Pole. Position the clamp around the body of the fuse holder and tighten the clamp.
7. Grasp the universal pole with both hands (approximately 2 feet apart) with one hand at the end of the pole opposite the handling tool. Lift the fuse holder up and out to remove it from the hinge, moving it to the side and out to avoid engagement with the ground studs.

Alternately, the fuse-mounting contacts may be tested for voltage and then grounded by means of grounding leads properly connected to both source-side and load-side fuse mounting contacts. Then the fuse holder may be lifted from the hinge by hand, using insulating rubber gloves.

8. If optional dual-purpose barriers are supplied, use grapppler to install into slide-in position to provide barrier between Auto-jet® fuse interrupter and fuse bottom hinge. See Figure 21.

CAUTION

Do not attempt to close main door unless open fuse has been removed from unit.

9. Re-fuse using the procedures included with the replacement fuse unit.
10. Remove optional dual purpose barriers, if supplied, using grapppler. See Figure 21.
11. Reinstall large clamp onto fuse holder and place fuse holder into fuse mounting in the 45° open (disconnect) position. Grasp the universal pole with both hands (approximately 2 feet apart) with one hand at the end of the pole opposite the handling tool. Lift the fuse holder and lower it into the hinge. Make sure that the fuse holder is seated securely in the hinge; then disengage the Large Clamp from the fuse holder.



Figure 19. Lift off fuse DP barrier.



Figure 20. With the fuses de-energized, open/close fuses using a grapppler tool. Fuses should be removed using a large clamp, following fuse manufacturer's instructions.

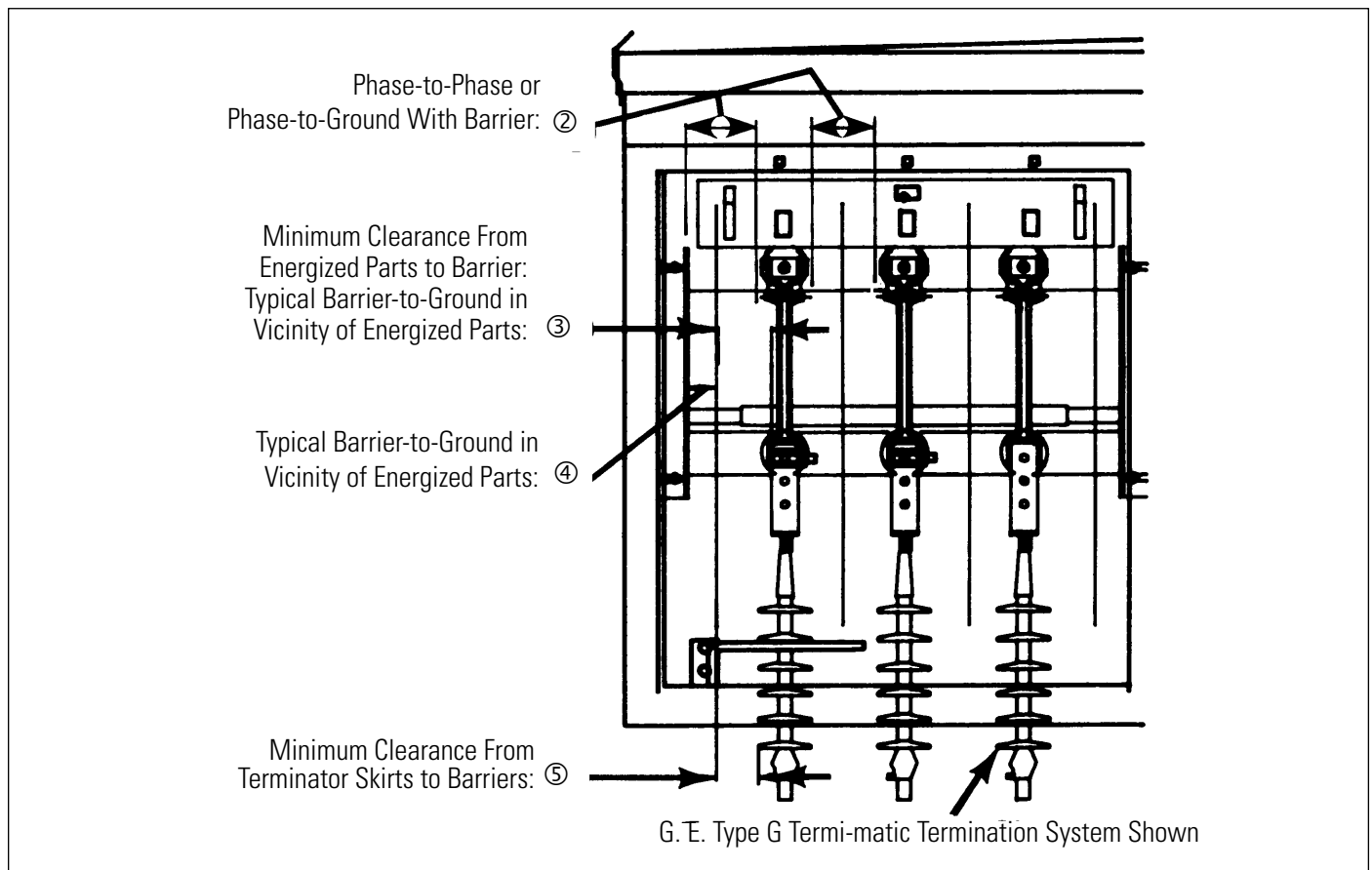


Figure 21. Install fuse DP barrier.

- Alternately, the fuse-mounting contacts may be tested for voltage and then grounded by means of grounding leads properly connected to both source-side and load-side fuse mounting contacts. Then the fuse holder may be inserted in the hinge by hand, using insulating rubber gloves.
13. Insert grapppler prong into fuse pull ring and push up briskly on the fuse holder, completing the closing stroke in one swift, non-hesitating motion. See Figure 20.
 14. Before removing grapppler from fuse pull ring, push firmly to assure that the fuse is completely closed and latched.
 15. Use grapppler to return optional dual-purpose barrier, if furnished, to the normal, hanging position. See Figure 19.
 16. Remove all grounds from switches and fuses. Re-install all barriers to the normal hanging position.
 17. Close the main enclosure door and padlock before leaving gear.
 18. Close all appropriate switches in the gear to re-energize the circuits. Close and padlock all switch-operating handle access covers.

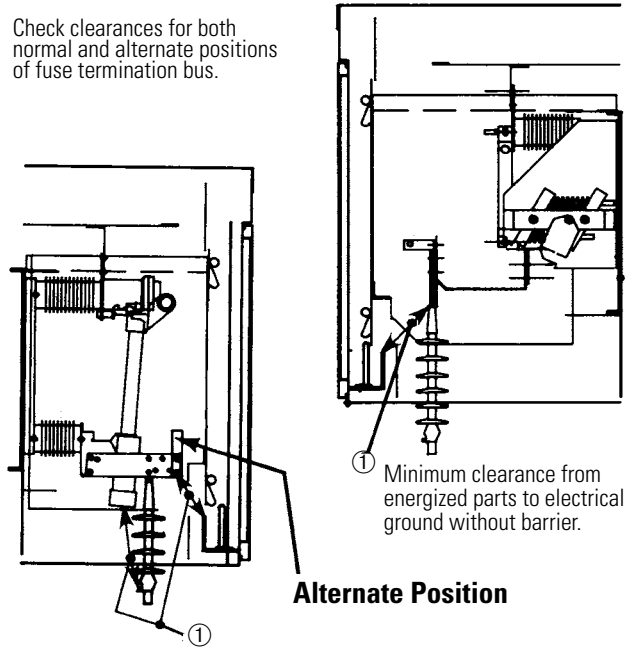
Recommended Clearances

15kV, 25kV Padmounted Unit Rating kV, BIL	Recommended Clearances (Minimum) in Inches				
	Phase-to-Phase or Phase-to-Ground without Barrier NOTE ①	Phase-to-Phase or Phase-to-Ground with Barrier NOTE ②	Energized Bus (or device) to Barrier NOTE ③	Barrier-to-Ground in Vicinity of Energized Bus (or device) NOTE ④	Terminator Skirts to Barriers NOTE ⑤
95	5-1/2"	3"	1"	3/4"	1/2"
125	7-1/2"	5"	2-1/4"	2"	1-1/4"



See table of Recommended Clearances page 11.

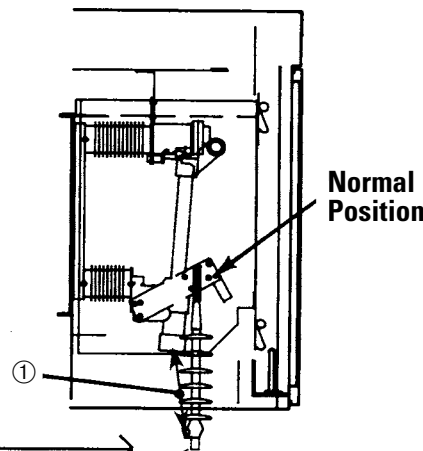
Check clearances for both normal and alternate positions of fuse termination bus.



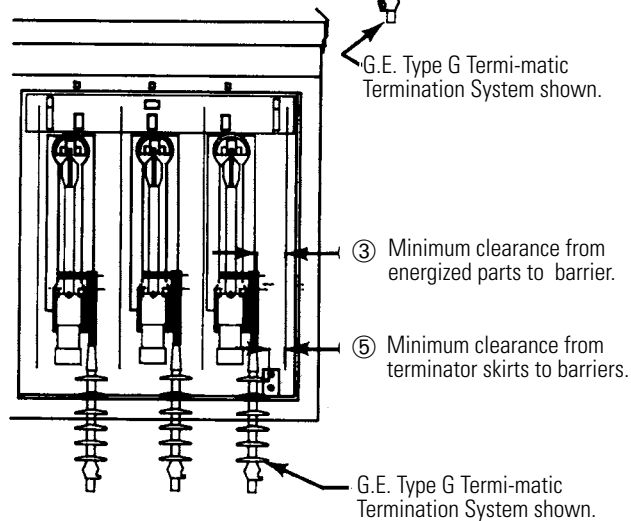
Minimum clearance from energized parts to electrical ground without barrier.

Check clearances for both normal and alternate positions of fuse termination bus.

Minimum clearance from energized parts to electrical ground without barrier.



G.E. Type G Termi-matic Termination System shown.





Fuse Ratings

Fuse Manufacturer and Type	Amperes RMS			3-Phase MVA SYM
	Max. Cont.	Interrupting Sym	Momentary ASYM <small>(11)(12)</small>	
At 14.4kV Nominal Voltage - 95kV BIL				
S&C SM-4 (1)	200	12,500	20,000	310
S&C SMU-20 (2)	200	14,000	22,400	350
S&C SM-5S (3)	400	25,000	40,000	620
Cutler-Hammer DBU (4)	200	14,000	22,400	350
Cooper (M-E) NX (5)	(5)	50,000	40,000	620
At 25kV Nominal Voltage - 125kV BIL				
S&C SM-4 (6)	200	12,500	20,000	540
S&C SMU-20 (7)	200	12,500	20,000	540
S&C SM-5S (8)	CONSULT FACTORY			
Cutler-Hammer DBU (9)	200	12,500	20,000	540
Cooper (M-E) NX (10)	(10)	50,000	40,000	1,080

- | | |
|---|--|
| <p>(1) SM-4 fused units are non-loadbreak type and require three S&C Cat. No. 86632R2 SM-4Z fuseholders and three S&C SM-4 fuse refills per fuse compartment. ††</p> <p>(2) SM-20 fused units are non-loadbreak type and require three S&C Cat. No. 3097 SM-20 fuse end fittings and three S&C SMU-20 fuse units per fuse compartment. ††</p> <p>(3) SM-5 fused units are non-loadbreak type and require three S&C Catalog No. 86642R2 SM-5S fuse holders and three S&C SM-5 fuse refills per fuse compartment.</p> <p>(4) DBU fused units are non-loadbreak type and require three FP Cat. No. EFA-42 DBU end fittings and three Cutler-Hammer DBU fuse units per fuse compartment. ††</p> <p>(5) NX fused units: Fuse mountings are non-loadbreak type and will accommodate one 100 ampere Cooper (McGraw-Edison) Type NX current limiting fuse rated 8.3kV, one 100 ampere fuse rated 13.5kV, or one 80 ampere fuse rated 15kV. Three sets of end fittings and three appropriately rated fuses are required in each fuse compartment. ††</p> | <p>(6) SM-4 fused units are non-loadbreak type and require three S&C Cat. No. 86633R2 SM-4Z fuseholders and three S&C SM-4 fuse refills per fuse compartment. ††</p> <p>(7) SMU-20 fused units are non-loadbreak type and require three S&C Cat. No. 3097 SML-20 fuse end fittings and three S&C SMU-20 fuse units per fuse compartment. ††</p> <p>(8) Consult factory for 25kv units with SM-5S fuses.</p> <p>(9) DBU fused units are non-loadbreak type and require three FP Cat. No. EFA-42 DBU end fittings and three Westinghouse DBU fuse units per fuse compartment. ††</p> <p>(10) NX fused units: Fuse mountings are non-loadbreak type and will accommodate one 100 ampere Cooper (McGraw-Edison) Type NX current limiting fuse rated 13.5kV, one 80 ampere fuse rated 15kV, or one 40 ampere fuse rated 23kV, or one 50 ampere fuse rated 27kV. Three sets of end fittings and three appropriately rated fuses are required in each fuse compartment. ††</p> <p>(11) Unit overall ratings are limited to the lowest component rating.</p> <p>(12) Ratings expressed in RMS amperes symmetrical are .625 times the asymmetrical values listed.</p> |
|---|--|

†† For fuse application and ordering information refer to the current issue of:

- S&C Bulletin 252-31
- Cooper (M-E) Cat. Sect. 240-60
- Cutler-Hammer Pub. No. B.20A.01.S.E.

◇ SM-5 fuses are non-loadbreak type. See S&C Instruction Bulletin 252-506.

Maintenance

Federal Pacific switchgear does not require routine mechanical or electrical maintenance. However, the following are some recommendations for enhancing continued service of the equipment.

1. Yearly mechanical exercising of the switch is recommended.

⚠ WARNING

The switchgear must be completely de-energized from all sources before any attempt is made to enter switchgear.

2. Check for cleanliness generally, but particularly for accumulation of any foreign material on insulators and barriers.

NOTICE

Barriers and insulators can be cleaned with a non-alcohol based cleaner that does not leave any residue when dry. Residue must be removed.

⚠ CAUTION

Do not put any lubricant on switch probe or puffer.

3. If the switch is closed on a short circuit within the fault closing rating and the short circuit is cleared by circuit breakers or fuses, the switch will not sustain damage which would require major repairs. However, the switch should be inspected before returning to service to determine switch condition.

Optional Features

Standard options can be supplied that best serve the customer's needs and operating practices. These are listed below with the applicable catalog number suffix.

Base Spacer

Non-compartmented or compartmented

Barriers — Inner Door

Lift-off insulating barrier secured with penta-head bolt

Fuse Storage Hooks

Finish Color and Special Cabinet Material

Ground Studs

Distribution Surge Arresters

Cable Terminators

Cable Supports (see below)

Terminal Adapters

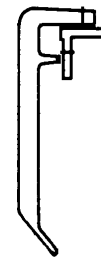
Fault Indicators

Copper Bus

Strip Heaters

Cable Supports for .75" to 2.0" Cable O.D.

1. Attach cable support to angle with arrow on support pointing up. Remove protective sheet from adhesive surface.



2. Place cable against adhesive saddle and install cable wrap starting at the top tie-horn.

