



Portable Remote Operating Mechanism For Pad-Mounted Switchgear (PROM-PM) Provides Portable Remote Switching and Arc-Flash Mitigation

As shown at the 2012 IEEE/PES T&D Show and Exposition, Federal Pacific has continued to expand its line of Portable Remote Operating Mechanism (PROM) offerings with a version designed for application on Federal Pacific Live-Front and Dead-Front pad-mounted switchgear. The PROM-PM allows manual Federal Pacific pad-mounted switchgear to be operated at distances of up to 50 feet from the switchgear. The mechanism can be quickly installed, operated, and removed from the switchgear without the need for drilling, the use of tools, or other modifications that might affect the integrity and security of the switchgear or tools.

Remote operation allows switching by personnel to be performed outside of the arc-flash boundary

zone. Perhaps even more importantly, this new tool allows field personnel to affect and regulate the one key variable under their control – distance from a potential arc event, rather than relying on others to perform mitigating functions (controlling the intensity or duration of the potential arc) at an unknown and unseen location or having to wear uncomfortable and restrictive PPE flash suits.

The PROM-PM, like the other PROM products gives field personnel the ability to directly control their exposure to arc-flash hazards without compromising the integrity or security of the pad-mounted switchgear. In addition, since no modifications are required, the unit can be installed in a short period of time.



Figure 1. PROM-PM Installed on a Live-Front PSI/II Model with Tank and Hose. The same PROM-PM can also be installed on Dead-Front PSE Units.



Figure 2. PROM-PM Mounting Plate secured in handle pocket.



Figure 3. PROM-PM Operating Mechanism secured to mounting plate.



Figure 4. PROM-PM on Operating Station.

Features:

- 1) Extendable 50 foot air-hose, with quick-connect pneumatic couplers on each end for connection to a CO₂ tank and the operating air-cylinder.
- 2) A two-piece welded steel operating mechanism, consisting of a removable base (3) and a pneumatic operating unit (4), which connect together quickly and easily with the two supplied heavy-duty wing-nuts.
- 3) The base provides secure attachment of the PROM-PM on the switchgear, with minimal weight to hold in place during the installation.
- 4) The pneumatic operating unit is easily and quickly installed on the base, by two smooth guide studs at the bottom, two threaded studs at the top, and all secured in place with the previously mentioned wing-nuts.
- 5) Air Cylinder on operating module with quick-connect couplers, one each for the closing and opening functions.
- 6) CO₂ tank, 15 pounds, provides approximately 150 operations per charge.
- 7) The portable operating station and carrier holds the CO₂ tank and stores the PROM-PM when not in use.
- 8) Optional two-wheeled dolly may be permanently secured to the Portable Operating Station.
- 9) The bottom of the Portable Operating Station is formed with a channel base to accommodate a standard two-wheeled dolly, if the permanently attached dolly option is not specified.

GENERAL

The Portable Remote Operating Mechanism (PROM) for Pad-Mounted Switchgear is an operational device developed by Federal Pacific to allow remote operation of manually operated pad-mounted switchgear, avoiding the expense associated with modifying the switchgear to accommodate motor operators.

One of the main applications of the PROM is to allow operation of manually operated Auto-jet®II switches from a location outside the “Flash Protection Boundary”, which NFPA 70E®: Standard for Electrical Safety in the Workplace® defines as “The distance from an exposed live part within which a person could receive a second-degree burn if an electrical arc were to occur.” The PROM is designed to be installed on Federal Pacific pad-mounted switchgear without modification to the existing switchgear, fitting into the existing switch operating pocket, and fitting on the existing hex switch-operating shaft. No drilling of the switch is required, allowing the PROM to be installed on energized switchgear, operated, and removed without the need to de-energize the switchgear.

INSTALLATION, OPERATION, AND REMOVAL OF THE PROM-PM

Components Provided

1. PROM-PM pneumatic operating device for Federal Pacific pad-mounted switchgear.
2. 15 pound CO₂ tank, appropriately charged.
3. 50 foot section of coiled flexible air hose.
4. Regulator, gauges, and valves.
5. Portable Operating Station and Carrier for operation, storage, and transportation of components (factory supplied attached dolly is optional).

Tools

In general, no hand tools are required for installation and operation; however, common hand tools such as an adjustable wrench or pliers may prove useful.

Installation Overview

1. Remove wing-nuts joining the PROM-PM base and the pneumatic operator.

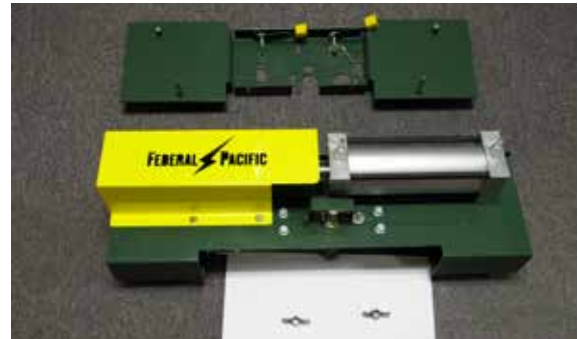


Figure 5. PROM-PM Base (top), Operator (middle) and wing-nuts (bottom).

2. Install the PROM-PM base into the switch operating pocket. The switch operating pocket access cover and operating handle do not need to be removed.



Figure 6. PROM-PM base installed in a switch operating pocket, levers to the left, and security hook installed in pocket eye hasp.

3. Install the PROM-PM pneumatic operator onto the base, noting that the smooth studs on the bottom have a groove at their base to help secure the operator and ensure greater stability when installing and removing the operator.
4. Secure the operator to the base with the wing-nuts.
5. Use the provided PROM-PM alignment aid to couple the shaft of the operator with the shaft of the switchgear.
6. Ensure that all components are tight and in proper alignment with the switchgear.
7. Connect the quick connect air hose to the appropriate connector on the PROM-PM operator to open or close the switchgear, as appropriate.



Figure 7. Top view of PROM-PM with hose connected to port on right.



WARNING- Compressed Gas

The Federal Pacific PROM-PM utilizes 15-pound pressurized cylinders of carbon dioxide gas (CO₂). When using compressed gas, all applicable safety rules and policies must be followed. This equipment should only be used by trained and qualified personnel.

Operation

8. Move the CO₂ tank outside of the arc-flash zone, up to 50 feet away from the switchgear.
9. Ensure that the check-valve at the CO₂ tank is closed prior to connecting the air hose to the tank.
10. The operator is activated by opening the valve at the CO₂ tank. The valve should be closed at the end of the switch operation.
11. In order to reverse the operation (close after open or open after close), the CO₂ tank should first be disconnected (to prevent inadvertent operation) before entering the arc flash zone.
 - a. The quick connect air hose should be moved to the appropriate position on the PROM-PM operator (refer to step # 7).
 - b. Repeat Steps 9 and 10.

Removal

12. Ensure that the shut-off valve at the CO₂ tank is closed.
13. Remove the quick-connect hose from the CO₂ tank.
14. Remove the quick-connect hose from the PROM-PM operator.
15. Remove the pneumatic operating unit from the base.
16. Remove the base from the pad-mounted switchgear.
17. Return the PROM-PM operating unit and its base to the portable operating station and carrier for storage for future use.
18. Reconnect the air hose to the CO₂ cylinder.

Maintenance

1. The PROM-PM and its components should be kept out of the weather when not in use.
2. All parts should be visually inspected for wear or damage before use and before storage after use.
3. All gears and the drive chain should be lubricated as needed or during normal maintenance cycles.

Storage

The PROM-PM, its gas cylinder, and fittings should be stored on, and secured to, the Portable Operating Station when not in use.

As noted above, the PROM-PM and its accessories should be stored out of the weather when not in use.



Figure 8. PROM-PM and accessories secured to the Portable Operating Station.

