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Industrial Solutions

# E9000\* Low-Voltage Motor Control Center Manual Racking Device for Arc Flash Mitigation Units Instruction Guide



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## Arc Flash Mitigation Units: Safety Features and Operating Instructions

GE's E9000<sup>®</sup> Motor Control Center (MCC) with Arc Flash Mitigation (AFM) units is a new offering for customers with specific applications where additional protection of personnel is essential.

The retractable stab mechanism allows for closed-door racking of the unit, allowing the stabs to be ENGAGED and DISENGAGED with the vertical bus without opening the unit door.

### AFM Safety Features

- Two-position closed-door retractable unit stabs
- Automatic operation of vertical bus isolation shutter
- Stab and shutter position indicators on unit doors
- Racking screw and disconnect interlock
- Padlock for racking screw
- Optional IP20 safety features and incidental contact barriers
- Stab and door interlock
- Stab and unit interlock

**WARNING:** Before racking the stab in/out, turn the breaker "OFF", disconnect it from all voltage sources. Never attempt to open the door before bringing the stab to completely "DISENGAGED" position.

### Read this document carefully before operating the unit.

Two manual racking handles are provided for each AFM line-up to "ENGAGE" and "DISENGAGE" the stabs with vertical bus.

### Manual Racking

The racking handle shown in Figure 1 is used to safely ENGAGE and DISENGAGE the AFM unit stab with the vertical bus.



Figure 1

### Before racking the stabs in or out, ensure the following:

- The unit latches are engaged with the shelves above and below the unit.
- The door is closed and all the door latches are engaged.
- The circuit breaker is in "OFF" position.

Remove the racking screw cover from the door as shown in Figure 2 to access the racking screw.



Figure 2. Removing racking screw cover from door

### Engaging the Stab

**Step 1:** Insert the racking handle in the hexagonal slot on the racking screw.

**Step 2:** Rotate the racking handle in clockwise direction to ENGAGE the stab.

**Step 3:** It takes approximately 14 to 18 rotations (number of rotations depends upon the NEMA size and ampere of the unit) to completely ENGAGE the stab. The stab engagement can be felt by a dead stop of racking screw rotation.

**Step 4:** The stab engagement with vertical bus can be verified by the mechanical indicators. In "ENGAGED" position the stab indicator will be "RED" and the shutter indicator will be "RED" as shown in Figure 3.



Figure 3. Mechanical indicators showing ENGAGED position

**Step 5:** After verifying the stab engagement, restore the racking screw cover in the door and ensure the cover is fastened properly.

**Note:** Never try to open the door when the stab is “ENGAGED” with the vertical bus and the breaker is “ON”. AFM units have a safety interlock to stop the user from opening the door when the stab is “ENGAGED”.

## DISENGAGING the Stab

**Step 1:** Insert the racking handle in the hexagonal slot on the racking screw.

**Step 2:** Rotate the racking handle in counter-clockwise direction to “DISENGAGE” the stab.

**Step 3:** It takes approximately 14 to 18 rotations (Depending upon the NEMA size and ampere of the unit) to completely DISENGAGE the stab. The stab is completely disengaged when the user feels a dead stop of racking screw rotation.

**Step 4:** The stab is completely disengaged from the vertical bus and can be verified by the mechanical indicators. In the “DISENGAGED” position, the stab indicator will be “GREEN” and the shutter indicator will be “GREEN” as shown in Figure 4.



Figure 4. Mechanical indicators showing DISENGAGED position

**Note:** A standard ¼ inch Hex key with torque gun can also be used to rack the stab in or out. The nominal rack in or out torque is 4.5 to 6.0 ft-lb (50 to 70 lb.-in).

## AFM Unit Safety Features

### Racking Screw and Disconnect Interlock

When the unit door is closed and the disconnect is turned “ON”, the access to the racking screw is covered as shown in Figure 5b, preventing the user from changing the position of the stab. The position of the stab can be changed only when disconnect is turned “OFF”, Figure 5a.



Figure 5a. Lead screw accessible in disconnect “OFF” condition



Figure 5b. Lead screw not accessible in disconnect “ON” condition

### Padlock Provision for Racking Screw

Access to the racking screw can also be restricted by rotating the padlock to cover the racking screw and by padlocking on the unit top plate as shown in Figure 6.



Figure 6. Padlockable lead screw cover

## Stab and Door Interlock

This interlock prevents the user from accidentally opening the door when the unit is energized (stab in “ENGAGED” position). This feature can be defeated by turning the defeater latch with a 5/32 hex key shown in Figure 7.



Figure 7. Defeater operation

**Caution:** Make sure the complete MCC section is deenergized before defeating the interlock.

## Stab and Unit Interlock

This feature prevents the user from taking the unit out when stab is energized or inserting the unit into the bus when stab is extended. The interlock shown in Figure 8 extends from the top of the unit when the stab is in an “ENGAGED” position. This interlock will collide with the shelf and stop the user from accidentally plugging the unit in or out when the stab is in “ENGAGED” position.



Figure 8. Stab and unit interlock shown extending through the top of the top plate

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