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Section 7—Maintenance

In this section:

Because Type VR circuit breakers are used in a variety of applications and environments, maintenance schedules should be developed for the particular end use. Until then, inspect circuit breakers after one year or every 1,000 operations, whichever occurs first. Also inspect circuit breakers after severe fault operations and record any contact erosion. This section covers proper inspection and maintenance procedures for Type VR circuit breakers. Remove the circuit breaker completely from the circuit breaker compartment before performing any maintenance or inspection on the circuit breaker.

⚠ WARNING

HAZARD OF PERSONAL INJURY OR EQUIPMENT DAMAGE

Before performing any maintenance or repair work:

- Always remove the circuit breaker completely from the compartment.
- Verify that the circuit breaker is OPEN (O) and the springs are discharged.

Failure to follow these instructions can result in death or serious injury.

General Inspection

Visually inspect the entire circuit breaker and operating mechanism for loose parts or connections. Examine the circuit breaker for evidence of overheating or excessive dirt or moisture. If necessary, remove the operating mechanism cover (Figure 7 on page 16) by carefully unclipping the back of the cover from the mechanism frame.

Insulating Surfaces

Using a clean, dry cloth, remove all dirt and moisture from the outside of the vacuum interrupters and from the insulating parts.

Vacuum Interrupters

To monitor the condition of the circuit breaker and the vacuum interrupters, perform the following checks. If the measurements consistently differ from target values, contact Schneider Electric for corrective procedures.

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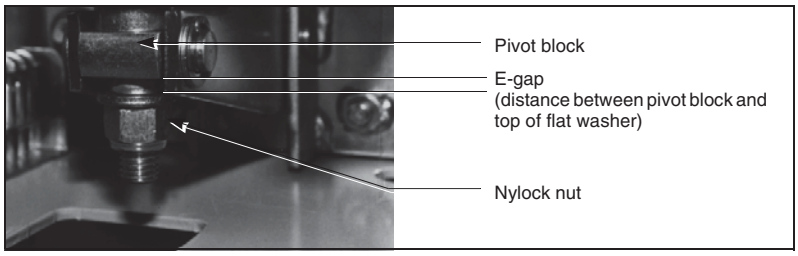
E-Gap

To measure E-gap, the circuit breaker must be completely removed from the circuit breaker compartment. The E-gap is the space between the pivot block, located below the pushrod at the bottom of the pole assembly, and the hex-shaped bias spring sleeve (Figure 14 on page 22). This distance should be measured before the initial installation of the circuit breaker, and then every year or every 1,000 operations.

The distance between the initial E-gap measurement and the current E-gap measurement is the amount of **contact erosion** that has occurred. When contact erosion exceeds 0.12 in., the vacuum interrupter may need to be replaced. Contact the factory for information. Follow the procedures on "Initial E-gap Measurement" on page 22 to measure the initial E-gap before installing the circuit breaker.

Figure 23: E-gap



⚠ DANGER

HAZARD OF ELECTRIC SHOCK, BURN, OR EXPLOSION

- Turn off all power supplying this circuit breaker.
- Always use a properly rated voltage sensing device to confirm that the power is off.
- Replace all devices, doors, and covers before turning on the power to this equipment.

Failure to follow this instruction will result in death or serious injury

Contact Erosion

Contact Erosion = *(initial E-gap measurement)* minus *(current E-gap measurement)*

Follow steps 1–7 to measure contact erosion.

1. Turn **OFF** all power supplying this circuit breaker.
2. Push the **CLOSE (I)** pushbutton. The springs may need to be manually charged first.
3. Use pin gauges, feeler gages, or drill bits to measure the space between the pivot block, located below the pushrod at the bottom of the pole assembly, and the top of the flat washer (Figure 14 on page 22). Accuracy should be in the order of 0.015 in. (1/64 in. or 0.5 mm).
4. Record E-gap in the maintenance log and follow the equation to determine the contact erosion. See Installation and Maintenance Log on page 39.
5. If the contact erosion exceeds 0.12 in. (3.05 mm) or the E-gap measurement reaches the absolute end-of-life dimension, the vacuum interrupter will need to be replaced. **Do not reset the E-gap.** Contact Schneider Electric for assistance.
6. Push the **OPEN (O)** pushbutton.
7. Replace all devices, doors, and covers.

   NOTE: The E-gap is factory set and should only be adjusted when installing a new vacuum interrupter pole assembly.

Hi-pot (Dielectric) Test

Hi-pot (high potential) tests need to be performed as part of a series of pre-operational tests (see “Hi-pot (Dielectric) Test” on page 23), regular maintenance, and as a method of determining the adequacy of equipment. Consistent unacceptable test results may indicate a loss of vacuum. Contact Schneider Electric for technical assistance.

Resistance Measurement

The resistance measurement from the upper conductor to the lower conductor on each phase of the circuit breaker should not exceed 50 micro ohms using a low-resistance ohm meter. A reading exceeding 50 micro ohms indicates that either a poor connection exists or that the vacuum interrupter has reached the end of its life cycle. The vacuum interrupter may need to be replaced. Contact Schneider Electric for technical assistance.

Vacuum Interrupter Pole Assembly Replacement

If the vacuum Interrupter pole assembly must be replaced due to severe interruptions, unsatisfactory hi-pot test results, excessive contact erosion, or high resistance, contact your local Schneider Electric field sales representative. See “Section 8—Replacement Parts” on page 37.

Lubrication

The location of each lubrication point and the method of lubrication required is shown in Table 3. Under normal conditions, lubricate after one year or 1,000 operations, whichever occurs first. More adverse conditions may require more frequent lubrication intervals and different procedures. Variations should be based on the experience of the operating company.

Always wipe the area clean before applying lubrication.

Table 3: Lubrication Chart

Lubrication Point During Maintenance Period	Method of Lubrication
Gear teeth in charging motor gear box	Wipe clean and apply Mobil® 28 red grease Square D part number 1615-100950
Contact surfaces on trip latch	
MOC linkage	
Primary disconnect contacts.	