

VAD-2 BREAKER  
INSPECTION CHECKLIST

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SQUARE D COMPANY  
ENGINEERED PRODUCTS DIVISION  
MEDIUM VOLTAGE SWITCHGEAR

I. INSTRUCTIONS

- 1) Inspection and test requirements are based on applicable sections of ANSI C37.
- 2) QC personnel shall perform the inspections and tests described in this procedure and initial each item.
- 3) Record rejected items on QCP 7.2 "REQUEST FOR INSPECTION". Do not approve until all items have been corrected.
- 4) Use Design Standard drawings and order related documents as inspection guides.

II. GENERAL DATA

FACTORY ORDER NUMBER \_\_\_\_\_  
CATALOG NUMBER \_\_\_\_\_  
SERIAL NUMBER \_\_\_\_\_

FINAL APPROVAL

INSPECTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
APPROVED FOR SHIPMENT \_\_\_\_\_ DATE \_\_\_\_\_

### III. PHYSICAL INSPECTION

- \_\_\_\_ 1. Verify connections (electrical and mechanical) are properly tightened.
- \_\_\_\_ 2. Verify plating and paint appearance are acceptable.
- \_\_\_\_ 3. Verify proper MOC operation.
- \_\_\_\_ 4. Verify correct charging motor has been installed.
- \_\_\_\_ 5. Verify proper counter operation.
- \_\_\_\_ 6. Verify breaker is properly lubricated using Mobil 28 (red) grease: (check-off each)
  - \_\_\_\_ Motor eccentric and grove
  - \_\_\_\_ Guide cam
  - \_\_\_\_ Charge and discharge indicator cam
  - \_\_\_\_ Charging gear
  - \_\_\_\_ Spring pivot points
  - \_\_\_\_ Racking worm gear
  - \_\_\_\_ All rollers and wheels
- \_\_\_\_ 7. Verify proper operation of the "test position" interlock.
- \_\_\_\_ 8. Verify racking arm stops are installed correctly.
- \_\_\_\_ 9. Verify racking mechanism interlock operates properly.
- \_\_\_\_ 10. Verify shims are installed on racking arm (no side-to-side motion).
- \_\_\_\_ 11. Verify control plug assembly operates smoothly.
- \_\_\_\_ 12. Verify guide pins for the CR plug are installed.
- \_\_\_\_ 13. Flex connector block is properly mounted and tightened.
- \_\_\_\_ 14. Verify correct "code-plate" is installed.
- \_\_\_\_ 15. Interrupter Type: \_\_\_\_ RP720 - 4A \_\_\_\_ WL34101B  
\_\_\_\_ WL34100B \_\_\_\_ WL34103B
- \_\_\_\_ 16. Interrupter Serial Number: A-phase \_\_\_\_\_  
B-phase \_\_\_\_\_  
C-phase \_\_\_\_\_

IV. ELECTRICAL OPERATION AND TESTS

\_\_\_\_\_ 1. Perform control wire dielectric test (2000 VAC for 1 sec).

NOTE: For special testing, record values: \_\_\_\_\_ VAC for \_\_\_\_\_ sec.

Rated operating voltages:

Motor: \_\_\_\_\_ V AC/DC    Close: \_\_\_\_\_ V AC/DC    Trip: \_\_\_\_\_ V AC/DC

\* NOTE: For special operating voltages record values in table below.

TABLE 1

RATED VOLTAGE	MINIMUM OPERATING VOLTAGE CLOSE COIL AND MOTOR	MINIMUM OPERATING VOLTAGE TRIP COIL	MAXIMUM OPERATING VOLTAGE
24 VDC	N/A	14 VDC	28 VDC
48 VDC	38 VDC	28 VDC	56 VDC
125 VDC	100 VDC	70 VDC	140 VDC
250 VDC	200 VDC	140 VDC	280 VDC
120 VAC	104 VAC	104 VAC	127 VAC
240 VAC	208 VAC	208 VAC	254 VAC

Based on applicable voltages from Table 1 above, perform the following operations:

- \_\_\_\_\_ 2. At "rated" supply voltage perform 75 breaker operations.
- \_\_\_\_\_ 3. At "rated" supply voltage, verify time required for the spring charging motor to recharge the closing springs.
- \_\_\_\_\_ sec (10 sec max.)
- \_\_\_\_\_ 4. At "maximum" supply voltage perform 5 close-open operations. Verify proper operation of the "anti-pump" relay.

IV. ELECTRICAL OPERATION AND TESTS (CONT.)

- \_\_\_\_ 5. At "minimum" supply voltage perform 5 close-open operations. Verify proper operation of the "anti-pump" relay.
- \_\_\_\_ 6. At "rated" supply voltage perform 5 close-open operations with the tripping mechanism being energized by the closing of the auxiliary contacts.
- \_\_\_\_ 7. At "rated" supply voltage perform 5 open-close operations for breakers intended for rapid auto-reclosing.
- \_\_\_\_ 8. At "rated" supply voltage perform 5 mechanical trip-free operations.
- \_\_\_\_ 9. Auxiliary contacts provide correct status of the main contacts.
- \_\_\_\_ 10. Verify correct coil resistances.

Trip coil \_\_\_\_\_ ohms

Close coil \_\_\_\_\_ ohms

V. MECHANICAL ADJUSTMENT

TABLE 2

	RP720 4A	WL34100B	WL34101B	WL34103B
CONTACT GAP - inches	.500 - .620	.450 - .500	.450 - .500	.480 - .530
OVERTRAVEL - inches	0.370	0.560	0.625	0.655
REBOUND GAP - inches (min.)	0.375	0.338	0.338	0.360
TRIP SPEED - msec (first 75 %)	5.4 - 6.4	6.2 - 9.0	6.2 - 9.0	7.0 - 9.6
CLOSE SPEED - msec (last 33 %)	4.4 - 6.2	2.0 - 3.3	2.0 - 3.3	3.1 - 4.2
TRIP TIME - msec (max.)	25	25	25	25
CLOSE TIME - msec (max.)	45	45	45	45

- \_\_\_\_ 1. Erosion gap adjusted: (0.156" - 0.219")

A-phase \_\_\_\_\_ inches

B-phase \_\_\_\_\_ inches

C-phase \_\_\_\_\_ inches

- \_\_\_\_ 2. Primary contact gap adjusted per Table 2.

A-phase \_\_\_\_\_ inches

B-phase \_\_\_\_\_ inches

C-phase \_\_\_\_\_ inches

VI. BREAKER PERFORMANCE TESTS

NOTE: For acceptance criteria see Table 2.

- \_\_\_\_ 1. Primary contact speed on opening: \_\_\_\_\_ msec
- \_\_\_\_ 2. Overtravel on opening: \_\_\_\_\_ inches
- \_\_\_\_ 3. Contact rebound does not exceed minimum contact gap requirement.
- \_\_\_\_ 4. Primary contact speed on closing: \_\_\_\_\_ msec
- \_\_\_\_ 5. Any contact bounce occurring after initial contact closing must have an open contact duration of  $\leq 0.002$  seconds.
- \_\_\_\_ 6. Response time from coil energization until primary contact status change.
- Trip \_\_\_\_\_ msec
- Close \_\_\_\_\_ msec
- \_\_\_\_ 7. Primary contact resistance (35 micro-ohms maximum)
- A-phase \_\_\_\_\_ micro-ohms
- B-phase \_\_\_\_\_ micro-ohms
- C-phase \_\_\_\_\_ micro-ohms
- \_\_\_\_ 8. Perform power frequency withstand test on the main circuit (36 kV phase-to-phase/phase-to-ground and across open contacts for 1 minute). \* Note: List special testing requirements below.

SYSTEM VOLTAGE	PHASE-TO-PHASE PHASE-TO-GROUND	ACROSS OPEN CONTACTS

VI. FINAL APPROVAL

- \_\_\_\_ 1. Verify primary fingers and ground fingers have been greased.
- \_\_\_\_ 2. Verify cover and breaker labels are properly located.
- \_\_\_\_ 3. Verify rating nameplate is installed and data is correct.
- \_\_\_\_ 4. Attach completed serial number nameplate to breaker.
- \_\_\_\_ 5. Verify all items on the checklist have been initialed.
- \_\_\_\_ 6. Complete Certificate of Factory Test (if applicable).
- \_\_\_\_ 7. Attach "OK TO SHIP" tag to breaker and deliver to shipping (OEM orders only).

Test Equipment Used

<u>Equipment ID #/ Description</u>	<u>Calibration Due Date</u>
<u>Q082 / Control Hi-Pot</u>	<u>          /          </u>
<u>Q083 - Q087 / Power Supply</u>	<u>          /          </u>
<u>Q044 / Fluke VOM</u>	<u>          /          </u>
<u>Q079 / Oscilloscope</u>	<u>          /          </u>
<u>Q086 / DLRO</u>	<u>          /          </u>
<u>Q072 / Primary Hi-Pot</u>	<u>          /          </u>
<u>Q076 / Pin Gauges</u>	<u>          /          </u>
<u>ME0011 / Calipers</u>	<u>          /          </u>