******* PSDS GENERATED *******

**TABLE I**

| BOEING STANDARD NUMBER BACC18AD | RATING AMPS | MAX VOLTAGE |
|---|---|---|
| 2 | 2.5 | .70 |
| 3 | 3.0 | .64 |
| 5 | 5.0 | .50 |
| 7 | 7.5 | .30 |
| 10 | 10.0 | .28 |
| 15 | 15.0 | .25 |

**TABLE II CALIBRATION PERFORMANCE REQUIREMENTS**

| TEST | PERCENT RATED CURRENT | TRIP TIME | AMBIENT TEMPERATURE DEG C |
|---|---|---|---|
| MAXIMUM HOLD CURRENT | 115 | NO TRIP (1 HR TEST) | 25 |
| MINIMUM TRIP CURRENT | 138 | 1 HR MAX | 25 |
| OVERLOAD CALIBRATION | 200<br>500<br>1000 | 4 TO 20 SEC.<br>.4 TO 2.0 SEC.<br>.10 TO .53 SEC. | 25 |
| AMBIENT EFFECT ON CALIBRATION | 115<br>165 | NO TRIP (1 HR TEST)<br>1 HR MAX | –54 |
| | 85<br>145 | NO TRIP (1 HR TEST)<br>1 HR MAX | 121 |

**TABLE III FAULT CURRENT INTERRUPTION PERFORMANCE REQUIREMENTS**

| TEST | SYSTEM | CALIBRATED FAULT CURRENT | TRANSIENT VOLTAGE AFTER CALIBRATED FAULT INTERRUPTION |
|---|---|---|---|
| S<br><br>T | 120 ± 5<br>VOLTS<br>400 Hz | 2800 AMPS, IN 25 CYCLES<br>AFTER FAULT INITIATION<br>.4 TO .5 LAGGING POWER FACTOR<br>(PF) [1] | 120 WITHIN 3 CYCLES<br>150 WITHIN 6 CYCLES<br>165 MAX [2] |
| U<br><br>V | 30 ± 2<br>VDC | 3400 AMPS IN .01 TO<br>.03 SECONDS AFTER FAULT<br>INITIATION | 28 WITHIN .002 SECONDS<br>50 MAX |



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3.4.5 TAMPER-PROOF CALIBRATION

Circuit breakers shall be constructed in such a manner that tampering with the calibration is not possible without dismantling the device or breaking a seal.

3.4.6 CIRCUIT BREAKER ACTUATOR

The portion of the actuator visible when the circuit breaker is in the closed position shall be black and shall expose a white band when in the open or tripped position. The exterior portion of the actuator shall be electrically insulated from all current carrying parts. The actuator shall not work out to an intermediate position, give a false trip indication, or be removable from the breaker.

3.5 PERFORMANCE

Unless otherwise indicated, circuit breakers shall perform as follows when subjected to the tests specified in the order outlined in Table II.

3.5.1 EXAMINATION OF PRODUCT

Circuit breakers shall meet the specified requirements when examined in accordance with 4.6.1.

3.5.2 DIELECTRIC STRENGTH

When tested as specified (4.6.2), the breakers shall show no evidence of arcing, flashover, breakdown or leakage current in excess of one milliampere.

3.5.3 INSULATION RESISTANCE

When tested as specified (4.6.3), the circuit breakers shall have an insulation resistance of not less than 100 megohms.

3.5.4 VOLTAGE DROP

When tested as specified (4.6.4), the voltage drop across each pole of each circuit breaker as measured from terminal to terminal shall not exceed the values indicated on the applicable Boeing Standard page.

3.5.5 OPERATING FORCE

When tested as specified (4.6.5), the forces necessary to operate the circuit breaker shall be within the limits specified on the applicable Boeing Standard page.

3.5.6 CALIBRATION

When tested as specified (4.6.6), the trip time of the circuit breaker shall be within the limits specified on the applicable Boeing Standard page.

3.5.7 OVERLOAD CYCLING

When tested as specified (4.6.7), the circuit breaker shall meet the 200 percent overload calibration trip requirement of the applicable standard during the cycling test. After cycling, the breaker shall meet the Maximum Hold and Minimum Trip current requirement as specified (4.6.6.1 and 4.6.6.2).

4.5 TEST METHODS

4.5.1 EXAMINATION OF PRODUCT

Circuit breakers shall be examined to verify that the materials, design, construction, dimensions, marking and workmanship conform to the requirements of this specification and to the applicable Boeing Standard page.

4.5.2 DIELECTRIC STRENGTH

The circuit breaker shall withstand a voltage potential of 1500 VRMS, 60 Hz between:

a. Terminals of adjacent poles of three phase circuit breakers.

b. Line and load terminals of the same pole, with the circuit breaker in the open position.

c. All terminals of the circuit breaker and all other exposed metal parts associated with the breaker.

The potential shall be applied at a maximum rate of change of 250 volts per second until the test potential is reached and shall be maintained for one minute during qualification tests. During the *Quality Conformance tests, a potential* equal to 120 percent of the above value may be applied for a duration of five seconds. No evidence of breakdown, flashover or leakage current in excess of one milliampere shall occur.

4.6.3 INSULATION RESISTANCE

The insulation resistance of all circuit breakers shall be as specified (see 3.5.3) when a test potential of 500 VDC is applied between all mutually insulated metal parts of the breaker.

4.6.4 VOLTAGE DROP

With the circuit breaker in the closed position, and the contacts carrying rated current, the voltage drop from terminal to terminal across each pole of the breaker shall not exceed the value indicated (See 3.5.4). Voltage drop measurements shall be made after the breaker has reached thermal equilibrium.

4.6.5 OPERATING FORCE

Using an appropriate push-pull type force gauge, the forces necessary to operate the actuator in order to mechanically open and close the contacts of the breaker shall be as specified (3.5.5).

4.6.6 CALIBRATION

Circuit breakers shall be connected as shown in Figure 1 and subjected to the calibration tests specified below. Test sample units with leads and terminals attached shall be maintained at the specified ambient temperature for one hour prior to application of the specified current during all calibration tests. AC or DC currents may be used. Each circuit breaker should be allowed a 20 minute minimum cooling period between successive calibration checks. During this cooling period the circuit breaker should be left in the open or tripped position.

4.6.6 CALIBRATION (Continued)

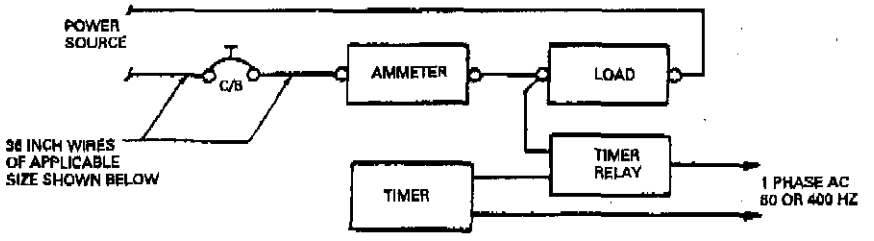


**Figure 1 CALIBRATION CIRCUIT**

**TABLE V C/B VS WIRE GAGE FOR CALIBRATION TESTING**

| Circuit Breaker Capacity (Amperes) | Wire Size (AWG) |
|---|---|
| 1 | 20 |
| 2 to 5 | 18 |
| 7 to 10 | 16 |
| 11 to 15 | 14 |
| 16 to 20 | 12 |
| 21 to 25 | 10 |
| 26 to 40 | 8 |
| 41 to 50 | 6 |
| 51 to 60 | 6 |
| 61 to 70 | 4 |
| 91 to 120 | 2 |

Notes:

1. Test lead wires shall conform to MIL–W–81381 or MIL–W–22759.
2. Terminals of the appropriate wire size and stud size shall be selected from MS25036 or BACT12AC.

4.6.6.1 Maximum Hold Current

When connected as shown in Figure 1, the circuit breaker shall be able to carry the maximum hold current specified on the applicable Boeing Standard page for one hour without tripping. For three phase circuit breakers, the maximum hold current shall be applied to all poles simultaneously.

4.6.6.2 Minimum Trip Current

When connected as shown in Figure 1, the breaker shall trip within 60 minutes when carrying the minimum trip current specified on the applicable Boeing Standard page. For three phase circuit breakers, the minimum trip current shall be applied to one pole while the other poles carry the unbalanced load specified on the applicable Standard Page.

4.6.6.3 Overload Calibration

The circuit breaker shall trip within the limits specified (3.5.6) when subjected to the overload calibration values given in the applicable Boeing Standard page. Each pole of three phase circuit breakers shall be tested separately with the remaining poles carrying zero current.

4.6.6.4 Ambient Effect on Calibration

The circuit breakers shall be tested at the ambient temperatures and loads specified on the applicable Boeing Standard page and shall be monitored for operation within the time limits specified.

4.6.7 OVERLOAD CYCLING

At 200 percent rated current resistive load, the circuit breaker shall be subjected to manual-make and automatic-break applied as follows: single-pole breakers shall be subjected to 50 cycles of normal trip-outs from the closed position and 50 cycles of trip-free trip-outs while the actuator is held in the closed position. Three phase breakers shall be subjected to 25 cycles of normal trip-outs from a balanced three phase overload. Each pole of the breaker shall then be individually subjected to 25 trip-free trip-outs. These tests shall be run at a manual cycling rated of 2 to 3 minutes per operation. Failure to trip automatically within the maximum limits specified on the applicable Boeing Standard page shall constitute failure. Following this test, the breaker shall meet the requirements for the Maximum Hold and Minimum Trip currents.

4.6.8 CORROSION

The breaker while in a closed position shall be mounted to an aluminum panel and subjected to the Salt Spray test Method 101, Test Condition B, of MIL–STD–202 with a five percent salt solution. Within 10 minutes after the test, the breaker shall be washed for five minutes under running water not warmer than 37.8 degree C accompanied by a slight brushing. The breaker shall then be dried in a forced draft oven for 90 minutes at approximately 57 degree C. Upon completion, the breaker shall be visually inspected and then subjected to a Voltage Drop test and a 200 percent Overload Calibration check except the trip times shall be 80 percent of the minimum specified trip time and 120 percent of the maximum specified trip time.

4.6.9 MOISTURE RESISTANCE

The circuit breaker while in the closed position shall be subjected to the Moisture Resistance test of Method 106 of MIL–STD–202, except that no vibration is required during step 7b. Distilled, demineralized or deionized water having a ph of between 6.5 and 7.2 at 25 degree C shall be used to obtain the desired humidity. On removal from the chamber, the breakers shall be manually shaken to remove excess water and allowed to dry at room ambient for 90 minutes. The breakers shall then be visually examined and subjected to the Dielectric Strength and Voltage Drop tests and a 200 percent Overload Calibration check. The post Moisture Resistance tests shall be conducted in the sequence specified.