

## ELECTROLYTIC CAPACITORS 100 AND 101 TYPES REQUIREMENTS AND ADJUSTING PROCEDURES

### 1. GENERAL

1.01 This section covers the 100-A, 100-B, 100-C, 100-D, 101-A and 101-B types of electrolytic capacitors per KS-2660, KS-3136, KS-6310, KS-6381 and KS-6093 and KS-6448.

1.02 Reference shall be made to Section 020-010-711 covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.

1.03 Part 1 General and Part 2 Requirements form part of the Western Electric Company, Inc. Installation Department Handbook.

1.04 The fluid provided in the No. 1-A and No. 2-A capacitor filling units freezes at approximately 32° F. therefore in installations where temperatures lower than this will be encountered provision must be made to furnish No. 1-B capacitor filling units in place of No. 1-A or No. 2-A filling units. Up to this date it has not been found necessary to code an outdoor or non-freezing capacitor filling unit in the 1 quart size equivalent to the No. 2-A filling unit. One No. 1-B, 3 gallon unit is sufficient for eight 101 type capacitors. The fluid provided in the No. 1-B capacitor filling units freezes at a lower temperature. This freezing will not damage the capacitor but the capacitance will be greatly decreased and the resistance will be increased during the frozen period.

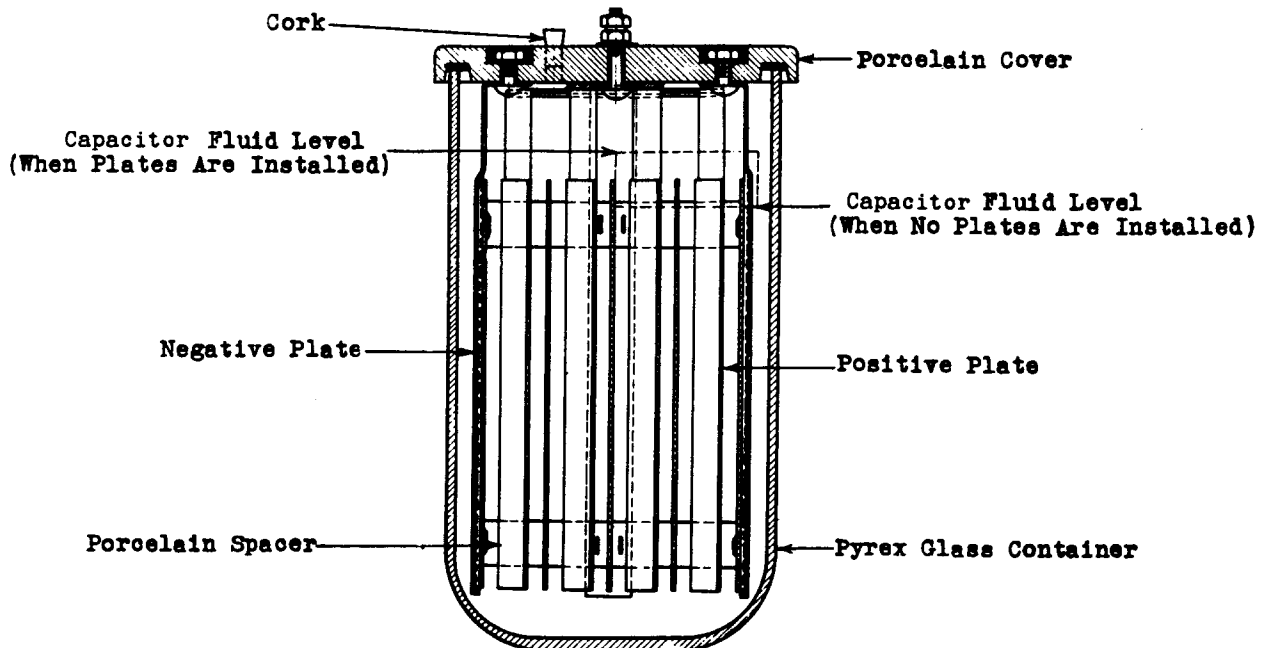


Fig. 1 - 100 Type Electrolytic Capacitor Assembly End View

**2. REQUIREMENTS**

**2.01 Level of Capacitor Fluid.** The level of the capacitor fluid with the capacitor assembled shall be approximately

100 Type Capacitors — Top of Black Rectangle

101 Type Capacitors — Raised Level Line

Gauge by sight.

**2.02 Temperature of Capacitor Fluid.** The temperature of the capacitor fluid during operation shall not exceed 105° F.

*Note:* When local conditions make it impossible to meet the above requirement, recommendations shall be obtained through the established routine.

Use thermometer on surface of jar.

**2.03 Depth of Oil.** The depth of oil upon the capacitor fluid with the capacitor assembled shall be approximately

100 Type Capacitors — 1/2 Inch

101 Type Capacitors — 1/4 Inch

Gauge by sight.

**2.04 Condition of Capacitor**

(a) All parts of the capacitor shall be in a satisfactory condition at all times.

(b) The capacitor elements shall not be short-circuited.

(c) When new the fluid and oil of the No. 1-A and No. 2-A filling units shall be clear and colorless. The solution of the No. 1-B unit may have an amber tint.

**2.05 Connections**

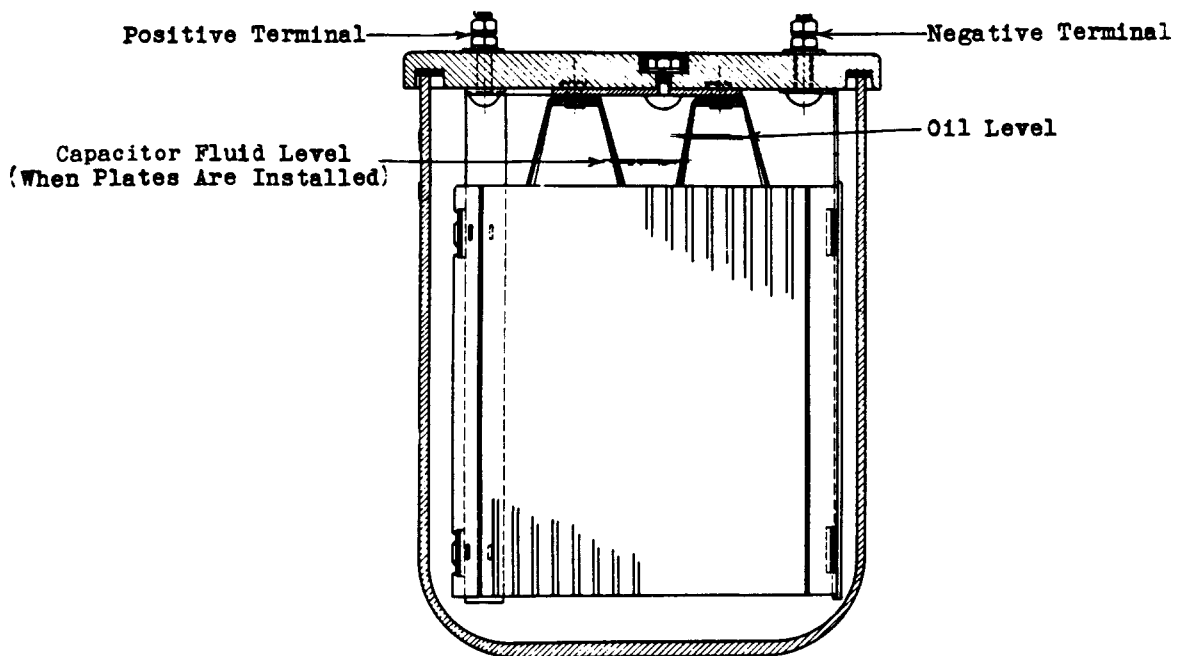
(a) The terminal marked + shall be connected to the positive potential and the terminal marked - shall be connected to the negative potential of the circuit.

(b) All capacitor connections shall provide satisfactory electrical contact and shall be free from corrosion.

**REASON FOR ISSUE — CHANGES IN REQUIREMENTS**

1. To revise the requirements of specification X-72002-01, Issue 1.

2. To add the requirements for the 101 types of electrolytic capacitors.



**Fig. 2 — 100 Type Electrolytic Capacitor Assembly Side View**

### 3. ADJUSTING PROCEDURES

#### 3.001 *List of Tools, Materials and Test Apparatus*

##### Tools

Pliers, P-Long Nose, 6-1/2 Inch A.T.&T.Co. Std. Dwg. 46-X-56

Wrench, Crescent, Adjustable, Double End, Flat, 6 Inch, 1/2 Inch and 3/4 Inch Openings

Brush, Varnish, Flat, 1 Inch, KS-2993

##### Materials

Cloth, KS-6350 or Equivalent

Capacitor Filling Units, As Required

Felt Pad

Oil, Hippo Pliable, No. 867

Sandpaper or Abrasive Cloth No. 00 or No. 000

##### Test Apparatus

Resistances, As Required

Thermometer, Battery or Commercial, Scale 0 to 120° F.

Volt-Ammeter, D-C. Weston Model 280

Scales 150-60-3 Volts, 30-.6-.06 Amperes

#### 3.01 *Level of Capacitor Fluid* (Reqt 2.01)

*M-1* If the level of the capacitor fluid is found to be below the required level check requirements 2.02 and 2.04, since appreciable reduction in level is usually the result of gassing caused by a trouble condition or by a cracked jar. Should no trouble be found notify the supervisor and place the capacitor under observation. It should not be necessary to add fluid unless it has been spilled or has leaked away, even though the level has gone below the tops of the plates.

#### 3.02 *Temperature of Capacitor Fluid* (Reqt 2.02)

*M-1* If the capacitor fluid heats up or gasses freely, check requirements 2.01, 2.04 and 2.05. Check the temperature by noting the temperature of the glass container, placing a thermometer against the outside of the jar and covering the bulb with a piece of felt or equivalent. Never put thermometer directly

into fluid since this would probably contaminate it and start trouble. Should the capacitor meet the above requirements make arrangements for replacing the capacitor, if necessary, and take the gassing capacitor out of service. Connect a resistance of the value given in the following table together with a milliammeter in series with the capacitor in the circuit and measure the direct current flowing through the capacitor with the maximum rated voltage impressed upon the capacitor. A storage battery may be used to supply this current if one of the proper voltage is available. Dry cells in series with the storage battery may be used to modify its voltage or an entire battery of dry cells may be used if necessary since the current required should be small.

**Caution:** *When connecting the milliammeter into the circuit use the largest scale first, re-connecting after it appears that the current can be read upon the smaller scales.*

TYPE	MAXIMUM NOMINAL VOLTAGE	SERIES RESIST. OHMS
100-A	33	50
100-B	75	100
100-C	18	25
100-D	150	300
101-A	33	100
101-B	53	200

*M-2* Observe the direct-current readings. If the reading is not less than 10 milliamperes for the 100 type and 1 milliamperes for the 101 type of capacitor within five days, replace the electrolytic capacitor. Exceptions to this are the higher voltage 100-B and 100-D capacitors in which the readings should decrease to less than 10 milliamperes within a week.

*M-3* In those instances when two capacitors are connected in series the two capacitors should be removed from the circuit and the capacitor having a high temperature should be treated as a single unit. To determine its condition, connect it across maximum nominal voltage for the particular type of capacitor in series with resistance and milliammeter as described above.

*M-4* With regard to the maximum temperature permitted it should be noted that a longer life may be expected if the capacitor

is operated in locations which will give temperatures not exceeding 80° F.

**3.03 Depth of Oil** (Reqt 2.03)

*M-1* If the depth of the oil is found to be less than the required thickness, check requirements 2.02 and 2.04. Should no trouble be found notify the supervisor.

**3.04 Condition of Capacitor** (Reqt 2.04)

*M-1* Replace any capacitor or parts that are damaged or not in a satisfactory condition. If replacing the part involves disassembling the capacitor and exposing it to contamination, it will generally be advisable to replace with a new capacitor.

**3.05 Connections** (Reqt 2.05)

*M-1* Check connections of capacitor to see that the capacitor has been correctly connected in the circuit. If the capacitor has

been connected incorrectly, reconnect correctly and reform the film if necessary, as outlined under 3.02.

*M-2* If connections to a capacitor have been broken and the capacitor is installed in a room containing open type storage batteries, the terminals after reconnecting should be painted with 3 coats of Hippo Permanent Pliable Oil #867, or equivalent, allowing sufficient time between coats for the previous coat to dry.

**REASON FOR ISSUE — CHANGES IN ADJUSTING PROCEDURES**

1. To revise the adjusting procedures of Specification X-72002-01, Issue 1.
2. To add adjusting procedures for the 101 types of electrolytic capacitors.