

## 117104 AND 117105

## CALOMEL REFERENCE ELECTRODES

1. GENERAL INFORMATION

As indicated in the table beneath the figure, the 117104 and 117105 Calomel Reference Electrodes are designed for use with different mounting units. The 117104 Electrode is normally used with the 117098, 117099, or 117100 Calomel Glass (Measuring) Electrode, while the 117105 Electrode is used with the Std. 1199-49, Std. 1199-50, or Std. 1199-51 Calomel Glass (Measuring) Electrode. The various parts of each electrode are illustrated and identified in the figure.

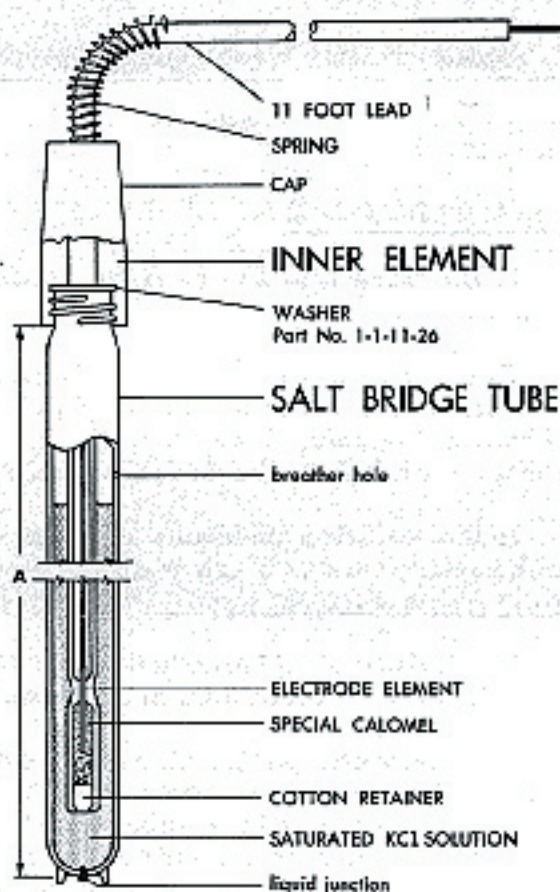
2. PREPARATION

Carefully unpack the inner element and the salt bridge tube which are packed separately.

Unscrew and remove the glass vial (not shown in the figure) and remove the rubber protector (also not shown) near the lower end of the inner element. The vial and rubber protector are required only for shipping and may be discarded. Do not discard the small washer or remove the cotton retainer (see figure).

Wash the inner element and the salt bridge tube in a saturated solution of potassium chloride (KCl). Apply a light coating of silicone grease around the outside surface of the breather hole. (This will help prevent the formation of crystals which might seal the hole.) Insert a wire through the hole to make sure that it is open.

When the salt bridge tube is screwed into the cap, the level of a saturated KCl solution in the tube should be about one-quarter inch below the



REFERENCE ELECTRODE	INNER* ELEMENT	SALT BRIDGE TUBE	DIST "A" APPROX	MOUNTING UNIT
117104	117132	117097	6"	7763 and -4
117105	117130	Std. 1199-AY	4 3/8"	7781 and -2

\*Includes all parts except salt bridge tube

breather hole. Pour enough solution into the tube to meet this requirement, and then add a few KCl crystals to make sure that the solution will remain saturated over the operating temperature range. (More crystals are required at high temperatures than at low temperatures.) Smear a little

(over)

silicone grease around the lip of the tube. Screw the tube into the cap, and tighten it firmly against the washer (1-1-11-26). Be sure this washer is lying flat against its seat in the cap; a good seal is essential when using the electrode under greater than atmospheric pressure.

Refer to the directions supplied with the mounting unit for instructions on installing and connecting the electrode.

### 3. MAINTENANCE

Make sure that the breather hole is open.

Keep the saturated KCl solution in the salt bridge tube at a level above the calomel but not above a point one-quarter inch below the breather hole.

If the solution becomes contaminated, pour it out. Wash the tube and inner element in clean, hot water (preferably distilled) and rinse them in a KCl solution. Then refill and replace the tube as described in Section 2.

The calomel paste should last indefinitely. However, erroneous readings or a reading substantially different from one obtained with a standard calomel electrode may indicate that the paste should be replaced. A kit of special calomel, cotton retainers, and instructions can be obtained for this purpose by ordering Std. 1199-31-G.

At lower temperatures or as the solution becomes more concentrated from the evaporation of water, white

crystals of potassium chloride may precipitate from the solution, thus partially blocking the liquid junction and raising the electrode resistance which will cause erroneous readings. In such cases, wash the tube and inner element in clean, hot water (preferably distilled) and rinse them in a KCl solution. Then refill and replace the tube as described in Section 2.

To store the electrode, place it in its normal vertical position and immerse it in distilled water to a depth not exceeding the level of the solution in the salt bridge tube.

If the salt bridge tube is stored dry for a long time, potassium chloride may crystallize in the liquid junction. To eliminate these crystals, fill the tube with a KCl solution and let it stand overnight in air. The formation of a powdery crust around the liquid junction indicates that the tube is ready for use. If this method fails, boil the tube in water for one-half to three hours, and then rinse it in distilled water before filling it as described in Section 2.

The salt bridge also may become clogged (have high resistance) for some reason other than that mentioned in the preceding paragraph. In such a case, use the cleaning procedure indicated in the preceding paragraph.

#### WARNING: POISON

The special calomel in this electrode is a deadly poison when taken internally. If there is any calomel paste on your hands, DO NOT handle food, cigarettes, or similar items.



LEEDS & NORTHROP