

YSI 3400 Series Conductivity Cells

Instructions

General Description

Conductivity cells are used to determine the electrical resistivity and conductivity of liquids. Dip cells are adaptable to many measurement situations and are useful for measurement in flowing or static open systems. Flow-through cells are designed for measurement and monitoring in closed systems, since they are connected directly into the liquid-carrying lines rather than dipped into containers. The 3445 flow-through cell has a built-in port that may be used as a thermometer well with any of YSI's small flexible temperature probes.

The specific resistance, or resistivity, of the liquid is the resistance of the liquid between the cell's electrodes, divided by the cell constant (K). Conductivity is the reciprocal of resistivity. The cell constant is a function of the area of the electrodes, the distance between them, and the size of the electrode chamber. These elements are controlled in the manufacture of YSI cells to give a warranted accuracy of $\pm 1\%$.

Pyrex Cells The cell bodies are made of Pyrex. The electrodes are a platinum-iridium alloy coated with platinum black, and are gold soldered to platinum lead wires. A 48 inch long instrument cable is integrally connected to the dip cells. Flow-through cell cables are separate and have spade lugs on each end. Two additional spade-lug-to-banana plug adapters are provided with each flow-through cell.

Plastic Cells The electrode chamber and stem of the cell are made of ABS plastic for ruggedness. The electrodes of the 3417 cell are made of platinum-iridium alloy and coated with platinum black; they are gold soldered platinum lead wires. The electrodes of the 3148 cell are of nickel rod. The cell cable is 48 inches long and is covered with neoprene insulation to permit immersion of both the cell and cable.

Part No.	Cell Constant	S.I. Cell Constant	Material	Overall Length	Max O.D.	Chamber I.D.	Depth
YSI Dip Cells							
3401	K=1.0/cm	K=100/m	Pyrex 7740	7 1/2"	1"	13/16"	3"
3402	K=0.1/cm	K=10/m	Pyrex 7740	6 1/4"	1"	13/16"	2 1/16"
3403	K=1.0/cm	K=100/m	Pyrex 7740	7"	1/2"	3/8"	2"
3417	K=1.0/cm	K=100/m	ABS	5 3/4"	1/2"	3/8"	3/4"
3418	K=0.1/cm	K=10/m	ABS	6 1/4"	1/2"	3/8"	1 3/16"
3440	K=10.0/cm	K=1000/m	Pyrex 7740	8"	1/2"	5/64"	3 3/8"

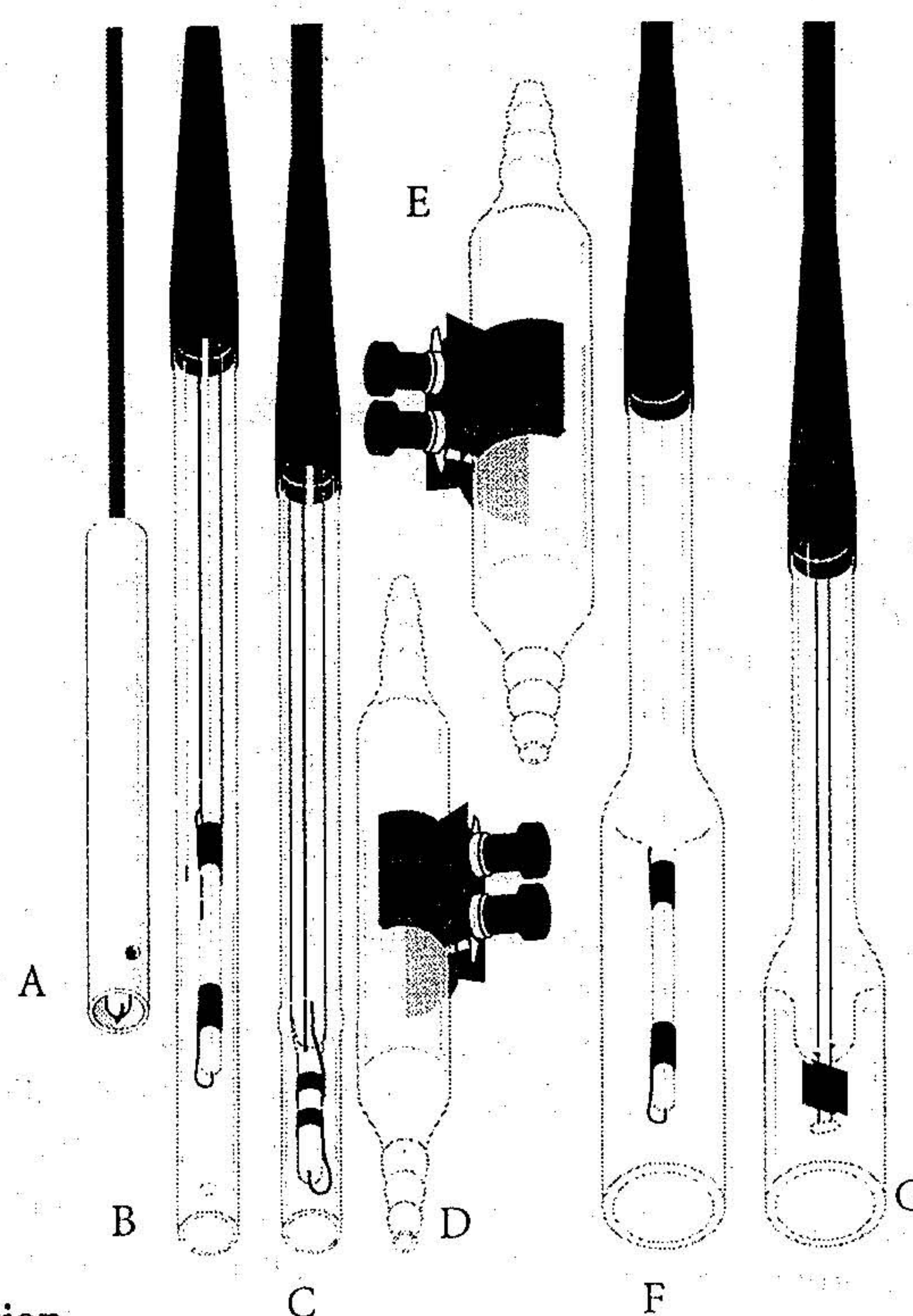
Flow-Through Cells							
3445	K=1.0/cm	K=100/m	Pyrex 7740	5 3/4"	3/4"	3/8"	3"
3446	K=0.1/m	K=10/m	Pyrex 7740	5 3/4"	1"	13/16"	3"

The nominal volumes of the flow-through cells are 15 mL for the YSI 3445 and 30 mL for the YSI 3446.

The cell part number, serial number and cell constant are fired onto the Pyrex cells and are stamped on the plastic cells.

See illustration for cell identification

- A: YSI 3417, 3418
- B: YSI 3440
- C: YSI 3403
- D: YSI 3445
- E: YSI 3446
- F: YSI 3401
- G: YSI 3402



Operation

Dip cells should be immersed so that the solution completely fills the electrode chamber with no air bubbles present. Glass cells **should not** be submerged to the point where the cable is attached. Plastic cell cables may be submerged. To ensure specified accuracy, cells must not be permitted to touch the bottom or sides of the solution container.

Flow-through cells should be connected to the tubing carrying the liquid to be measured. Flow may be in either direction or liquid may be measured while still. Observe the following cautions for flow-through cells:

1. Do not immerse the cell or allow exterior to get wet. If it does get wet in use, dry it immediately.
2. Pressure: Use the appropriate safety precautions (safety shield, goggles) whenever high pressure is a possibility.
3. Flow rate limit: 7 gallons per minute
4. Fluid Temperature Limit: 100°C.
5. Air bubbles must not be present in the cell chamber.
6. Metal hoseclamps may damage the cell and are not recommended.

Cleaning and Storage

The single most important requirement in conductivity measurement is a clean cell. A dirty cell will contaminate the solution and cause the conductivity to change.

1. Any foaming bathroom tile cleaner will clean the cell adequately. When stronger cleaning is required, use a solution of equal parts isopropyl alcohol and 10N HCl. CAUTION: Cells should not be cleaned in aqua regia or any solution known to etch platinum or gold.
2. Dip or fill the cell with cleaning solution and agitate for two to three minutes.
3. Rinse the cell in several changes of distilled or deionized water, and inspect the platinum black electrode coating to see if replatinization is required.
4. It is best to store cells so that the electrodes are immersed in deionized water. Dip cells may be placed in any container; flow-through cells should be filled, not submerged. The electrodes in cells stored in water will require less frequent replatinization. Any cell that has been stored dry should be soaked in distilled water for 24 hours to ensure complete wetting of the electrodes.