YSI 3200 Series Conductivity Cells

Conductivity cells are used to determine the electrical resistivity and conductivity of liquids. Dip cells are adaptable to many measurement situations; they are useful for measurement in flowing or static open systems. Flow-through cells are specially designed for ease of measurement and monitoring in closed systems, since they are connected directly into liquid-carrying lines rather than dipped into containers as are conventional dip cells. Fill cells are useful for small sample measurements.

The specific resistance, or resistivity, of the liquid is the electrical resistance of the liquid between the cell's electrodes, divided by the cell constant (K). Conductivity is the reciprocal of resistivity.

The cell constant (K) 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 result in a warranted accuracy of ±1%. Cell constants of YSI conductivity cells are shown in the table below.

The cell bodies are made of either Pyrex glass or ABS plastic. The electrodes are a platinum-iridium alloy coated with platinum black; they are gold soldered to platinum lead wires. A 48 inch long instrument cable is integrally connected to cells. The cable connector is a 7 pin mini-DIN which plugs directly into the instrument. Each cell contains a built-in thermistor enabling automatic temperature compensation.

YSI Cells with Built-In Temperature Sensors

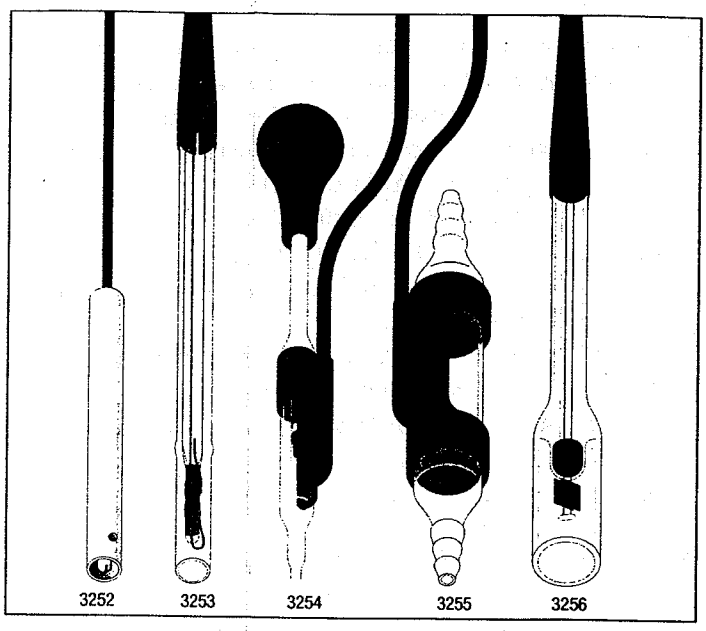
Part No.	Cell Type	cgs Cell Constant	S.I. Cell Constant	Material	Overall Length	Max O.D.	Chamber I.D.	Chamber Depth	Volume
3252	dip	1.0/cm	100/m	ABS plastic	5 3/4"	1/2"	3/8"	3/4"	
3253	dip,micro	1.0/cm	100/m	Pyrex 7740	7"	1/2"	3/8"	2"	
3254	fill	1.0/cm	100/m	Pyrex 7740	5 5/16"	3/4"	7/16"	3 1/4"	5 mL
3255	flow	0.1/cm	10/m	Pyrex 7740	5 3/4"	1"	13/16"	3"	30 mL
3256	dip	0.1/cm	10/m	Pyrex 7740	6 1/4"	1"	13/16"	2 1/16"	

Further discussion of conductivity, conductance, and measurement considerations may be found in the instruction manuals for YSI conductivity instruments.

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 beyond the point where the cable is attached. Plastic cells are designed to permit deep immersion; their cables may be submerged. To assure measurements within 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 in flow-through cells or liquid may be measured while still. Observe the following cautions and limitations for flow-through cells:



1. Do not immerse cell or allow exterior to get wet. If it does get wet in use, dry it immediately.
2. Pressure: Use 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. Use appropriate tubing for temperature above 50°C.
5. Air bubbles must not be present in the cell chamber, or measurement accuracy will be affected.
6. Metal hose clamps may damage the cell and are not recommended.

Cleaning and Storage

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

1. Any one of the foaming acid tile cleaners, such as Dow Chemical "Bathroom Cleaner," will clean the cell adequately. When a stronger cleaning preparation is required, use a solution of equal parts of isopropyl alcohol and 10 normal HCl.

Caution: Cells should not be cleaned in aqua regia or in any solution known to etch platinum or gold.

2. Dip or fill the cell with the cleaning solution and agitate it for two or 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 and fill should be filled, not submerged. The electrodes in cells stored in water will require less frequent replatinization than those that dry out between periods of use. Any cell that has been stored dry should be soaked in distilled water for 24 hours before use to assure complete wetting of the electrodes.