

Conductivity measuring cells are used in analytical procedures in combination with measuring transducers to determine the conductivity of liquids.

Conductivity

The electrolytic conductivity is defined as the ability of a substance to conduct an electrical current.

Measurement of the conductivity depends on the concentration of the medium being measured.

Aqueous solutions of such electrolytes as salts, acids or alkalis can conduct electrical currents. The electrical charge is carried by ions. The higher the concentration (number of ions per unit volume), the greater the conductivity of the solution concerned. However, the conductivity does not change linearly with the concentration and depends on a number of different factors.

To a large extent, the conductivity of a solution depends on its temperature. The mobility of the ions increases as the temperature rises, thus simultaneously increasing the conductivity. A temperature increase of 1°C causes the conductivity to rise by 1 or 2%. This consequently makes it important to ensure a constant temperature for conductive measurement.

Conductive conductivity measuring cells

Twin-electrode conductivity measuring cells comprise a continuous-flow, immersion or screw-in enclosure of plastic or stainless steel and the electrodes inside this enclosure. The electrodes are made of stainless steel, platinum or a special graphite material and are available with different cell constants. Temperature sensors may also be installed, depending on the application in question. The measuring cells are connected to a power supply either via a permanently connected lead or via a plug-and-socket connection.

The conductivity measuring cells are connected directly to the measuring transducers (TOPAX MV or conductivity measuring transducer LF 430).

Measurement error

Measurement errors may be due to contamination of the electrodes, particularly with oil and grease, although polarization effects on the electrode surface and decomposition of the electrodes, especially in highly conductive solutions, can also give rise to measurement errors.

Inductive conductivity measurement

There are no electrodes in direct contact with the solution when measuring the inductive conductivity.

The measuring probe is made up of two encased measuring systems. One measuring system generates a current in the solution which changes proportionally with the conductivity of the solution and induces a current in the other system. This induced current is measured by the transducer.

This principle eliminates the problems of electrode contamination through non-conductive deposits, polarization and electrode decomposition.

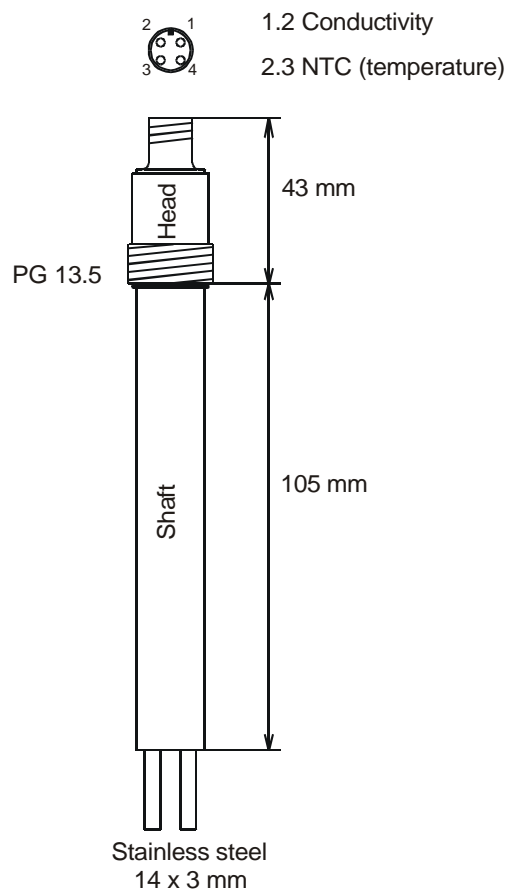
Inductive measurement of the conductivity can basically be used from a measuring range of 1 $\mu\text{S}/\text{cm}$ upwards or in highly polluted media. This consequently means that the conductivity can be measured largely without requiring maintenance, even in such media.

Technical data
Conductivity measuring cells, type : LE 110 2-electrode system, conductive

- For connection to the measuring transducer TOPAX MV **Part No.: 45000504**
- and conductivity measuring transducer LF 430.1 **Part No.: 44300092**

Electrode mount : Heavy-duty screw thread PG 13.5
 Electrical connection : 4-pin plug connector with screw terminals

Measuring range up to 20 mS/cm	
Cell constant	0.3-1.0
Probe material	PP
Electrode material	Stainless steel
Max. temperature	80° C
Max. pressure	16 bar
Temperature sensor	NTC
Part No. 41100028	MB: 0.00 ... 20,00 µS/cm
Part No. 41100029	MB: 0.00 ... 2000 µS/cm
Part No. 41100030	MB: 0.00 ... 1000 µS/cm

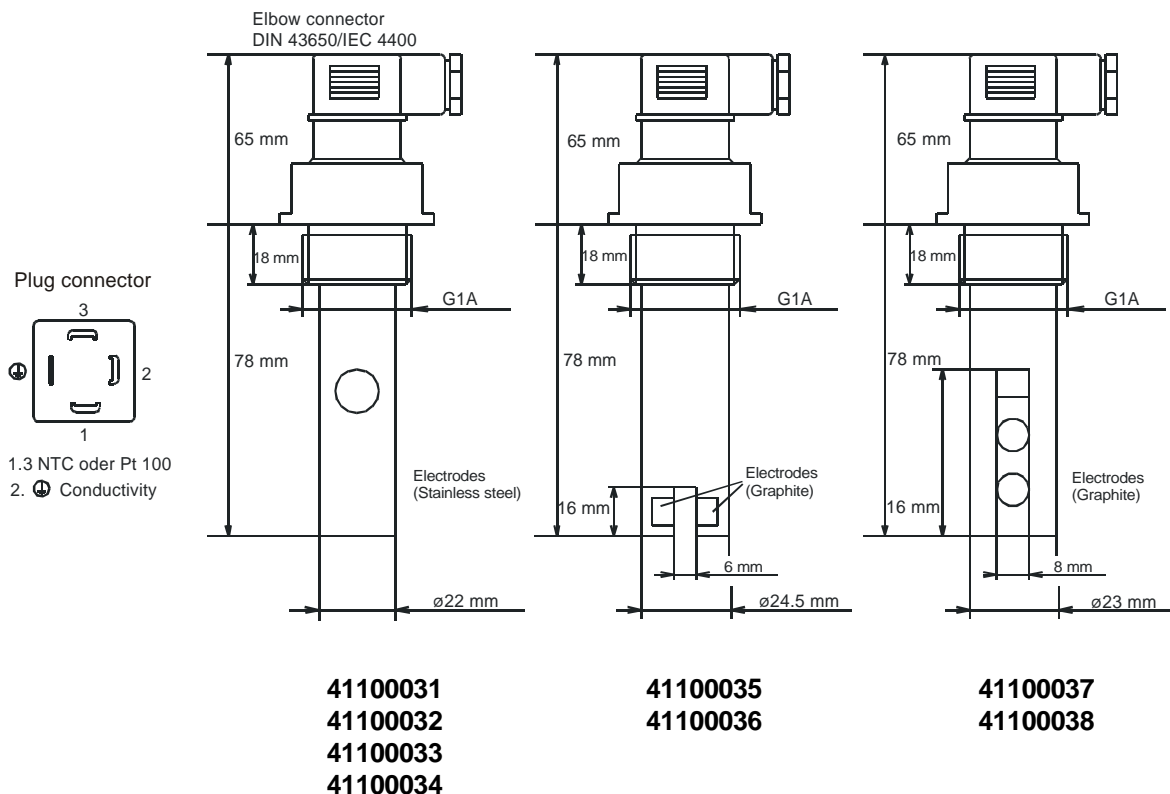
Dimensions


- For connection to conductivity measuring transducer LF 430 Part No.: 44300091

Electrode mount : G1A
 Electrical connection : Plug connector

	Measuring range up to 1000 μ S/cm			
Cell constant	0.1	0.1	0.1	0.1
Probe material	PVC	PVC	PVC	PVC
Electrode material	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Max. temperature	55° C	55° C	135° C	135° C
Max. pressure	6 bar	6 bar	16 bar	16 bar
Temperature sensor	-	Pt 100	-	Pt 100
Part No.	41100031	41100032	41100033	41100034

	Measuring range up to 10 mS/cm		Measuring range up to 30 mS/cm	
Cell constant	1	1	3	3
Probe material	PVDF	PVDF	PVDF	PVDF
Electrode material	Graphite	Graphite	Graphite	Graphite
Max. temperature	135° C	135° C	135° C	135° C
Max. pressure	16 bar	16 bar	16 bar	16 bar
Temperature sensor	-	Pt 100	-	Pt 100
Part No.	41100035	41100036	41100037	41100038



- For inductive conductivity measuring systems see product group MB 45500.