

# TetraCon<sup>®</sup> 700

## Conductivity Cells



### TetraCon<sup>®</sup> 700

The TetraCon<sup>®</sup> 4-electrode cell from WTW is the perfect result of an application-oriented development. Compared with conventional 2-electrode cells, this advanced design provides substantially better performance, particularly in the higher conductivity ranges.

TetraCon<sup>®</sup> 700 conductivity sensors are especially suitable for use in wastewater treatment plants dealing with highly loaded sewage. Due to the special measuring technique employed, severe influences from primary and secondary polarization effects are eliminated, resulting in improved accuracy of the sensor. Provided the devices are installed in accordance with the manufacturer's instructions, errors due to the distortion of the current and voltage fields are also avoided.

The special cell geometry of the TetraCon<sup>®</sup> 700 makes it impervious to fouling, and the abrasion resistant carbon electrodes are also easy to clean. The modern epoxy resin encapsulation technique used diminishes the likelihood of sensor breakage in harsh industrial environments.

### Features

- Exceptional linearity due to 4-electrode design
- Elimination of polarization effects
- Large measuring range with only a single cell
- Stable cell constant due to abrasion resistant carbon electrodes
- Integrated temperature sensor
- Optimum cell geometry without dead volume
- Immersion depth of only 30 mm required
- Highly resistant to fouling contaminants
- Maintenance friendly, rugged design



## Conductivity Cells

### TetraCon® 4-electrode Design

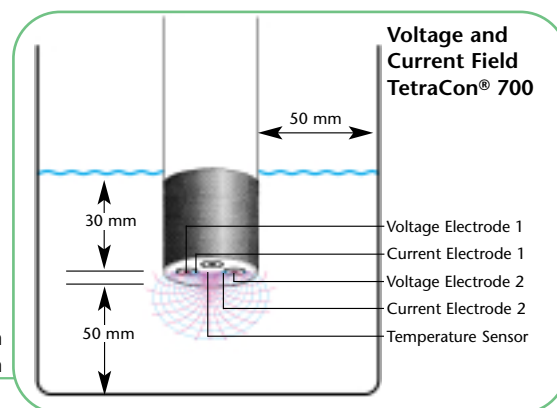
The conductivity of a given electrolyte is determined by an electro-chemical resistance measurement. In its simplest configuration, the measuring cell uses two electrodes to which an alternating voltage is applied. The electric current which is directly proportional to the free ions in the electrolyte is measured. The electronic instrument then calculates the conductivity of the solution, taking into account the absolute cell constant of the sensor.

With the TetraCon® 4-electrode design, two separate electrode pairs are used whereby the currentless voltage

electrodes produce a stable and constant reference potential. The voltage drop at the current electrodes is regulated via a potentiostat circuit.

The advantage of this technique is that it eliminates measurement errors usually caused by polarization effects which most likely build up at higher conductivity levels. Contact resistance problems caused by contaminated electrodes is also largely avoided by this design.

Minimal Distance: 50 mm  
Minimal Immersion Depth: 30 mm



### WTW Conductivity Sensors

#### TetraCon® 700

Rugged conductivity sensor (4-electrode design), with integrated dual thermistor, abrasion resistant carbon electrodes and break-proof epoxy body; measuring range 10  $\mu\text{S}/\text{cm}$  to 1000  $\text{mS}/\text{cm}$ . Submersible sensor assembly specially designed for use in wastewater treatment plants.

#### TetraCon® 325

4-electrode conductivity cell with graphite electrodes, integral temperature probe; measuring range 1  $\mu\text{S}/\text{cm}$  - 2000  $\text{mS}/\text{cm}$ . Suitable for universal applications.

#### TetraCon® DU/T

4-electrode conductivity cell with integral flow-thru chamber (7 ml volume), built-in temperature sensor; measuring range 1  $\mu\text{S}/\text{cm}$  to 2000  $\text{mS}/\text{cm}$ . Recommended for standard industrial applications.



LRD 01

LRD 325

#### LRD 01

316 L stainless steel conductivity cell for installation in pipes. Built-in temperature sensor (130 °C max.), measuring range 0.01 to 200  $\mu\text{S}/\text{cm}$ , pressure resistant up to 14 bar, 1/2 inch NPT thread.

#### LRD 325

Conductivity measuring cell for installation in pipes. With built-in temperature sensor (up to 100 °C). Measuring range 1  $\mu\text{S}/\text{cm}$  to 2  $\text{S}/\text{cm}$ , pressure resistant up to 10 bar. 1/2 inch NPT thread.

#### LR 325/01

Low-level conductivity cell with flow-thru chamber, integrated temperature sensor; measuring range 0.001 to 300  $\mu\text{S}/\text{cm}$ . For use in ultra-pure water applications; e.g., boiler feed water.

#### LR 325/001

Like Model LRD 325/01, but with higher resolution; measuring range 0.0001 to 30  $\mu\text{S}/\text{cm}$ . Sensor is especially designed for trace measurement in both aqueous and non-aqueous or partially aqueous media.

## Specifications Conductivity Cells

	TetraCon® 700	LRD 01	LRD 325
<b>Sensor Type</b>	4-electrode cell	2-electrode cell	4-electrode cell
<b>Measuring Ranges</b>	10 µS/cm ... 1000 mS/cm	0.01 ... 200 µS/cm	1 µS/cm ... 2 S/cm
<b>Cell Constants</b>	K = 0.917 cm <sup>-1</sup> , ±1.5% (in free solution) K = 0.933 cm <sup>-1</sup> , with EBST 700-DU flow-thru adapter	0.1 cm <sup>-1</sup> , ±1.5%	0,475 cm <sup>-1</sup> , ±1.5%
<b>Temperature Sensor</b>	Integrated dual NTC	Integrated NTC	Integrated NTC
<b>Temperature Range</b>	0 °C ... +50 °C, ±0.2 K	0 °C ... +130 °C, ±0.2 K	0 °C ... 100 °C, ±0.2 K
<b>Maximum Pressure</b>	10 bar at 20 °C	14 bar at 20 °C	10 bar at 20 °C
<b>Electrical Connection</b>	Cable fitted with 7-pole watertight plug (IP 65)		
<b>Certifications</b>	CE, GS, CUL, UL		
<b>Material</b>	Sensor head: PVC Body: 316 Ti stainless steel  Protection rating: IP 68 (NEMA 4X)	Cell body: 316 Ti stainless steel Threaded 1/2 inch NPT  Protection/Electrode: IP 68 (NEMA 4X)	Measuring cell: epoxy/graphite Thread: V4A steel 1.4571 Protection/Electrode head: IP 68
<b>Abmessungen</b>	196 x 40 mm Length x Dia.	133 x 25 mm Length x Dia.	133 x 25 mm Length x Dia.
<b>Gewicht</b>	0.66 kg, approx.	0.35 kg, approx.	0.3 kg, approx.

## Conductivity Cells for Special Purposes

	TetraCon® 325	TetraCon® DU/T	LR 325/01	LR 325/001
<b>Sensor Type</b>	4-electrode cell		2-electrode cell	
<b>Electrode</b>	Carbon	Carbon	316 Ti stainless steel	316 Ti stainless steel
<b>Measuring Ranges</b>	1 µS/cm ... 2 S/cm	1 µS/cm ... 2 S/cm	0.001 µS/cm ... 300 µS/cm	0.0001 µS/cm ... 30 µS/cm
<b>Cell Constant</b>	K = 0.475 cm <sup>-1</sup>	K = 0.778 cm <sup>-1</sup>	K = 0.1 cm <sup>-1</sup>	K = 0.01 cm <sup>-1</sup>
<b>Temperature Sensor</b>	Integrated	Integrated	Integrated	Integrated
<b>Flow-thru Measurement</b>	No	Yes	Yes, with additional flow chamber D01/T	Yes, with integrated flow chamber
<b>Length</b>	120 mm	155 mm	120 mm	120 mm