

TetraCon[®] 700

Conductivity Cells



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

TetraCon[®] 700

The TetraCon[®] 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[®] 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[®] 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.



TetraCon® 4-electrode Design

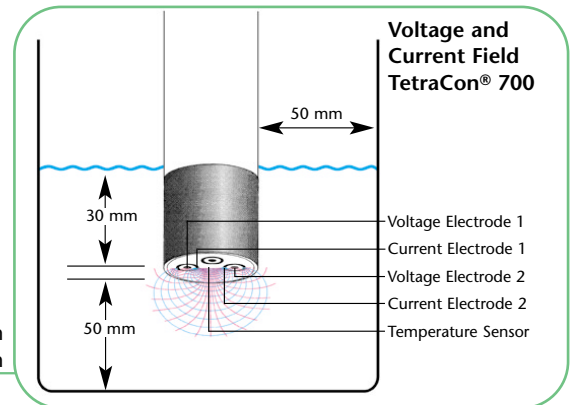
The conductivity of a given electrolyte is determined by an electro-chemical resistance measurement. In its simplest configuration, the measuring cell uses two electrodes to which an alternating voltage is applied. The electric current which is directly proportional to the free ions in the electrolyte 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 elec-

trodes 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

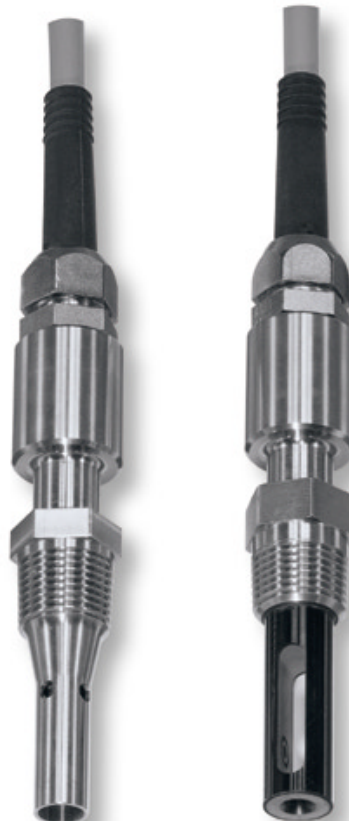
Rugged conductivity sensor (4-electrode design), with integrated dual thermistor, abrasion resistant carbon electrodes and break-proof epoxy body; measuring range 10 $\mu\text{S}/\text{cm}$ to 1000 mS/cm . Submersible sensor assembly specially designed for use in wastewater treatment plants.

TetraCon® 325

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

Technical Data Conductivity Cells

	TetraCon® 700	LRD 01	LRD 325
Sensor Type	4-electrode cell	2-electrode cell	4-electrode cell
Measuring Ranges	10 µS/cm ... 1000 mS/cm	0.01 ... 200 µS/cm	1 µS/cm ... 2 S/cm
Cell Constants	K = 0.917 cm ⁻¹ , ±1.5% (in free solution) K = 0.933 cm ⁻¹ , with EBST 700-DU flow-thru adapter	0.1 cm ⁻¹ , ±1.5%	0,475 cm ⁻¹ , ±1.5%
Temperature Sensor	Integrated dual NTC	Integrated NTC	Integrated NTC
Temperature Range	0 °C ... +50 °C, ±0.2 K	0 °C ... +130 °C, ±0.2 K	0 °C ... 100 °C, ±0.2 K
Maximum Pressure	10 bar at 20 °C	14 bar at 20 °C	10 bar at 20 °C
Electrical Connection	Cable fitted with 7-pole watertight plug (IP 65)		
Certifications	CE, GS, CUL, UL		
Material	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
Dimensions	196 x 40 mm Length x Dia.	133 x 25 mm Length x Dia.	133 x 25 mm Length x Dia.
Weight	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
Sensor Type	4-electrode cell		2-electrode cell	
Electrode	Carbon	Carbon	316 Ti stainless steel	316 Ti stainless steel
Measuring Ranges	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
Cell Constant	K = 0.475 cm ⁻¹	K = 0.778 cm ⁻¹	K = 0.1 cm ⁻¹	K = 0.01 cm ⁻¹
Temperature Sensor	Integrated	Integrated	Integrated	Integrated
Flow-thru Measurement	No	Yes	Yes, with additional flow chamber D01/T	Yes, with integrated flow chamber
Length	120 mm	155 mm	120 mm	120 mm



Conductivity Cells

Ordering Information – Conductivity Cells

	Description	Order No.
TetraCon® 700-1,5	Submersible conductivity sensor, cable length 1.5 m	302 314
TetraCon® 700-7	Submersible conductivity sensor, cable length 7.0 m	302 316
TetraCon® 700-15	Submersible conductivity sensor, cable length 15.0 m	302 318
TetraCon® 700-SO	Submersible conductivity sensor, cable length to be specified	302 319V
LRD 01-1,5	Screw-in conductivity cell, cable length 1.5 m	302 220
LRD 01-3	Screw-in conductivity cell, cable length 3.0 m	302 221
LRD 01-7	Screw-in conductivity cell, cable length 7.0 m	302 222
LRD 325-1,5	Screw-in conductivity cell, cable length 1.5 m	302 225
LRD 325-3	Screw-in conductivity cell, cable length 3.0 m	302 227
LRD 325-7	Screw-in conductivity cell, cable length 7.0 m	302 229
TetraCon® 325	Universal conductivity cell, cable length 1.5 m	301 960
TetraCon® 325-3	Universal conductivity cell, cable length 3.0 m	301 970
TetraCon® 325-6	Universal conductivity cell, cable length 6.0 m	301 971
TetraCon® 325-10	Universal conductivity cell, cable length 10.0 m	301 972
TetraCon® 325-15	Universal conductivity cell, cable length 15.0 m	301 973
TetraCon® 325-20	Universal conductivity cell, cable length 20.0 m	301 974
TetraCon® DU/T	Conductivity cell with flow-thru chamber, without cable	301 252
LR 325/01	Flow-thru conductivity cell, cable length 1.5 m	301 961
LR 325/001	Flow-thru conductivity cell for low level, cable length 1.5 m	301 962
KKDU 325	Connecting cable for TetraCon® DU/T, length 1 m	301 963
Adapters		
ADA/AMPH-LF	Adapter for connection of conductivity cells TetraCon® 700- LRD 01 and LRD 325 to LF 296 monitor (see page 249)	303 215
ADA/AMPH-LAB-LF	Adapter for connection of laboratory conductivity cells or TetraCon® 325 to LF 170 monitor (see page 249)	303 212
ADA/LAB-LF	Adapter for connection of laboratory conductivity cells or TetraCon® 325 to LF 296 monitor (see page 249)	303 216
Accessories LRD 01 / LRD 325 (see also Accessories Section)		
EST-LRD	Stainless steel (1.4571) weld-in socket 1/2" NPT for installation of LRD 01 and LRD 325 in pipes	303 209
ADA-3/4 NPT	Threaded bush for adaption from 1/2" NPT to 3/4" NPT thread	303 201
ADA-G 1 Zoll	Threaded bush for adaption from 1/2" NPT to G 1" thread	303 202
ADA-LF-DN 20	PVC bonding sleeve with 1/2" NPT inner thread for installing LRD 01 / LRD 325 in DN 20 plastic pipes	303 203
ADA-DN 25	PVC reducing bush for adaption from DN 20 to DN 25	303 204
ADA-DN 32	PVC reducing bush for adaption from DN 20 to DN 32	303 205
ADA-DN 40	PVC reducing bush for adaption from DN 20 to DN 40	303 206
ADA-DN 50	PVC reducing bush for adaption from DN 20 to DN 50	303 207

On-line
Instrumentation

General
Features

Oxygen
(D.O.)

pH/ORP

Conductivity

Temperature

IQ
SENSOR NET

Accessories

Analyzer

Sample
Preparation

Liquid
Samplers

Monitoring/
Control
Station

Customer
Service