



Conductivity Measurements

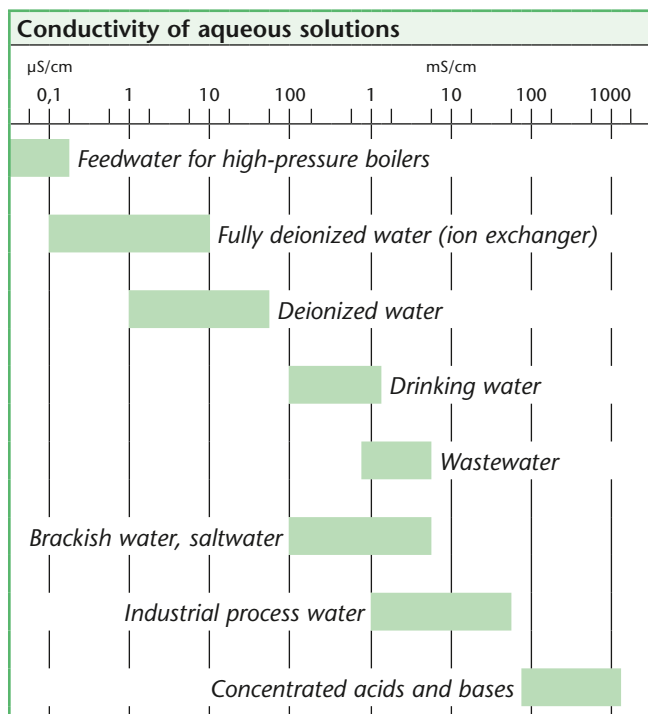
Conductivity Meters – The Electrolytical Conductivity

Conductivity is a parameter used to measure electrical properties of a solution. The more salt, acid or alkali in a solution, the greater its conductivity. The unit of conductivity is S/m, often also S/cm.

The scale for aqueous solutions begins with pure water at a conductivity of 0.05 $\mu\text{S}/\text{cm}$ (25 °C/77 °F). Naturally occurring waters such as drinking water or surface water have a conductivity in the range 100 – 1000 $\mu\text{S}/\text{cm}$. At the upper end of the chart some acids and bases can be found.

Conductivity measurements are used for applications such as in the production of ultrapure water or determining the salinity of saltwater.

Conductivity is measured by making a measurement of the electrical resistance. The simplest kind of measuring cell used consists of two similar electrodes. An alternating voltage applied to one of the electrodes causes the ions in the solution to migrate towards the electrodes. The more ions in the solution, the greater the current which flows between the electrodes. The instrument measures the current and uses Ohm's law to calculate first the conductance of the solution and then – by taking the cell data into account – the conductivity.



Application Range Conductivity Measurements

● Recommended by WTW ○ Conditionally applicable – Not recommended

Application Range	inoLab®			ProfiLine Cond 1970i	VARIO® C _{ond}	MultiLine® IDS ^{µS_B}	Portable meters		
	Multi IDS ^{µS_B}	Cond 7110	Cond 7310				Cond 3110	Cond 3210	Cond 3310
Routine measurement	○	●	–	–	●	○	●	●	–
Routine measurement with documentation	●	–	●	●	–	●	–	–	●
AQA with documentation	●	–	●	●	–	●	–	–	●
R&D high precision	●	–	●	●	–	●	–	●	●
Control measurements	●	–	●	●	●	●	–	●	●
LIMS connection	●	–	●	○	–	●	–	–	●
Quality assurance	●	–	●	●	–	●	–	●	●
Training	○	●	●	○	●	○	●	●	○
Service	–	–	–	●	●	●	●	●	●
Laboratory measurements	●	●	●	●	●	○	–	–	○
Field measurements	–	–	–	●	–	●	●	●	●
Depth measurements	–	–	–	●	–	●	–	–	–
External control/ PC connection/ PC control	● – –	– – –	● – –	● – –	– – –	● – –	– – –	– – –	● – –
Salinity/TDS measurement	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / –	● / ●	● / ●
Specific resistance	●	●	●	–	●	●	–	●	●
Suitable for pharmacopeia	–	●	●	●	–	–	–	●	●
Measurement of ultrapure water	●	●	●	●	●	●	–	●	●
Trace conductivity	–	●	●	●	–	–	–	●	●
<i>see page</i>	70	73	72	78	79	74	77	76	75

For conductivity measurements with multi-parameter instruments, see pages 14 and 18

Application Range Sensors	KLE 325	TetraCon®			LR		TA 197 LF	TetraCon® 925 ^{µS_B}	LR 925/01 ^{µS_B}
		325	325/S	DU/T	325/01	325/001			
Chemical water	○	○	–	●	–	–	–	○	–
Ultrapure water (Pharmacopeia)	–	–	–	–	●	●	–	–	●
Ground water	●	●	–	–	–	–	●	●	–
Surface water	●	●	–	–	–	–	–	●	–
Depth measurements (barrages)	–	○	–	–	–	–	●	○	–
Laboratory measurements	●	●	–	–	●	●	–	●	●
Food industry (juices)	–	●	–	○	–	–	–	●	–
Swimming pools	●	●	–	○	–	–	–	●	–
Pharmaceuticals	○	●	–	○	●	○	–	●	●
Cosmetics/detergents	–	–	●	–	–	–	–	–	–
Semi-conductor industry	–	–	–	–	●	●	–	–	●
Paint/varnish (water-soluble)	–	●	○	–	–	–	–	●	–
Electroplating	–	●	–	–	–	–	–	●	–

applicable instruments:

- ① ProfiLine Cond, 3110, 3210, 3310
- ② all analog instruments except VARIO®
- ③ all analog instruments except VARIO® + Cond 3110
- ④ Cond 197i / 1970i

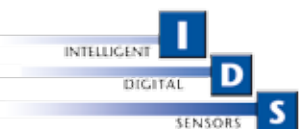
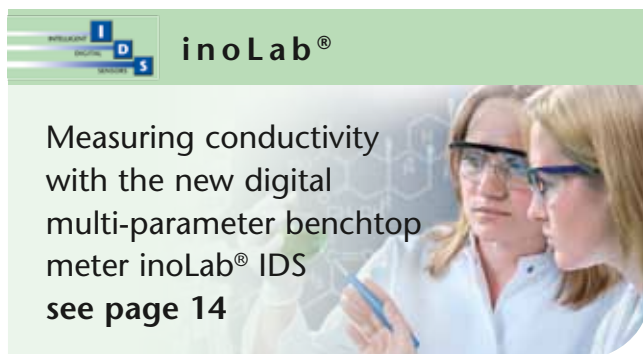
only MultiLine® IDS
and inoLab® IDS

Parameter
Multi-parameter
pH
ORP
ISE
Dissolved Oxygen (D.O.)
Conductivity
Data logger/flow + level
BOD/Respiration
Photometers
Turbidity
Colony Counter
Software/Printers

NEW

Laboratory Conductivity Meters

Conductivity is an important parameter in monitoring water quality. In the laboratory sector this parameter has increased in importance since the introduction of pharmacopeia standards for pharmaceutical water. WTW inoLab® laboratory conductivity instruments meet all the requirements for measurements according to this standard.



Determining conductivity...

... with the innovative inoLab® Multi 9310 IDS

With the new inoLab® Multi 9310 IDS measuring conductivity in the laboratory becomes even more reliable. The IDS technology enables ideal measurements and efficient documentation in the easiest way. The cell constant and other parameter data, such as reference temperature and temperature compensation, are inseparably and distinctively linked to the IDS conductivity cell. Wrong measurements due to inattentiveness with changing the cell are therefore excluded.

inoLab® Multi 9310 IDS



- Measuring consistency without compromises
- Digital sensor recognition
- Complete documentation

Measuring consistency

- Error-free measurements through pre-programmed cell constants
- Storage of measuring parameters simplifies application-oriented working
- Proven, high-quality basic sensors to cover all measuring application areas



GLP/AQA compliant documentation

- Automatic, digital recordings of all sensor data for traceability of measuring values
- User administration can be activated, for allocation of user and measuring results
- Export of data in .csv format via USB interface to PC, on demand formatted exporting into Excel (MultiLab® Importer, included in delivery scope or as download).
- Data output via optional built-in printer.

Flexible and powerful:

- Two IDS conductivity cells for applications between 0.01 $\mu\text{S}/\text{cm}$ and 2000 mS/cm
- Output of conductivity, TDS, salinity or specific resistance
- Reference temperature 20°/25°C
- Data storage for large batches of measurements



Technical Data

Model	inoLab® Multi 9310 IDS μS_{cm}
Measuring channel	1 (universal)
Display	LCD graphic, backlit
CMC/QSC	yes/yes
Data storage	manual 500/5000 automatic
Logger	manual /time-controlled
Interface	Mini USB
Printer (optional)	thermo printer, width 58 mm
Power supply	universal power supply 100 up to 240 V, 50/60 Hz, 4 x 1,5 V AA or 4 x 1,2 V NiMH rechargeable batteries

Ordering Information

Digital inoLab® multiparameter SETs μS_{cm}		Order No.
inoLab® Multi 9310 IDS SET 3	Digital multiparameter benchtop meter, set including IDS sensor, for measurements/documentation according GLP/AQA. With single channel input for pH/mV, dissolved oxygen and conductivity. Meter with universal power supply, stand and operation manual, digital IDS conductivity cell TetraCon® 925, 0.01 mol/l KCl, conductivity standard, software and USB cable.	1FD353
inoLab® Multi 9310P IDS SET 3	Same as 1FD353, but with integrated thermal printer.	1FD353P

IP 43

cETLUS

For other SETs or measuring cells in SET, see WTW Product Details

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

Reliable conductivity documentation...

... with the inoLab® Cond 7310

The new inoLab Cond 7310 is ideal for precision measurements in combination with automatic documentation complying with GLP/AQA in quality laboratories of all branches. An optional built-in printer is also available if required.

inoLab® Cond 7310

- USB interface for fast data transfer
- Data output in .csv format or via optional built-in printer
- Battery or AC power operation



Measuring safety

- Repeatable measuring results provided by the active, automatic AutoRead function with recognition of stable end values
- The sensor symbol provides information about the condition of the electrode
- Graphic display with plain text menu for convenient and safe operation

Documentation complying with GLP/AQA

- Alphanumerical input of conductivity cell serial number
- Transfer of all data in .csv format via USB interface onto PC, on demand formatted export into Excel (MultiLab® Importer included in delivery scope or as download).
- Data output via optional built-in printer.

Flexible and powerful:

- For all common WTW conductivity cells
- Measures TDS, salinity and specific resistance
- Backlit graphic display for brilliant visibility
- Suitable for measurement complying with Pharmacopeia



Measuring conductivity precisely...

... with the inoLab® Cond 7110

The new inoLab® Cond 7110 is a routine conductivity measuring meter for the laboratory with a large display and functions, facilitating precise measurements.

Parameters such as salinity, specific resistance and TDS also cover the determination of non-daily measured parameters. As several special cells can be connected, the most diverse applications can be addressed.

inoLab® Cond 7110

- Easy and intuitive operation
- Measuring range up to 1000 mS/cm
- Including stand and sensor holder

Measuring safety

- Repeatable measuring results through automatic AutoRead function
- Calibration timer for scheduled monitoring of the conductivity measuring cells
- Precise recording of measuring data through highest quality electronics

Easy-to-use and reliable:

- Measures conductivity, TDS and salinity
- Connecting special electrodes is possible
- Linear, non-linear (nlf) and temperature compensation can be turned-off



Technical Data		
Model	inoLab® Cond 7110 all values ±1 digit	inoLab® Cond 7310 all values ±1 digit
Conductivity	0 µS/cm ... 1000 mS/cm ±0.5 % of value	0 µS/cm ... 1000 mS/cm ±0.5 % of value
Salinity	0.0 ... 70.0 (acc. to IOT) 0.00 ... 20 MOhm cm	0.0 ... 70.0 (acc. to IOT) 0.00 ... 20 MOhm cm
TDS	0 ... 1999 mg/l	1 ... 1999 mg/l, 0 bis 199,9 g/l
Temperature	-5.0 ... 105.0 °C ±0.1 °C (23 ... 221 °F)	-5.0 ... 105.0 °C ±0.1 °C (23 ... 221 °F)
Cell constant	0.450...0.500 cm ⁻¹ , 0.09 ... 0.110 cm cm ⁻¹ , 0.800 to 0.880 cm ⁻¹ , 0.25 ... 2.5 cm ⁻¹ , fix 0,01 cm ⁻¹	Fix 0.01 cm ⁻¹ , calibration 0.450...0.500 cm ⁻¹ , 0.800 to 0.880 cm ⁻¹ , adjustable 0.09 ... 0.110 cm ⁻¹ , 0.250 ... 25.0 cm ⁻¹
Calibration	1-point	1-point
T _{ref}	20 °C/25 °C (68 °F/77 °F)	20 °C/25 °C (68 °F/77 °F)
Temperature compensation	nLF, linear 0.000 to 3.000 %, can be switched-off	nLF, linear 0.000 to 10.000 %, can be switched-off

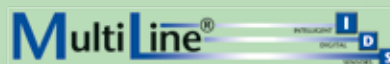
Ordering Information		
inoLab® Laboratory Conductivity Meter SETs		Order No.
inoLab® Cond 7110 SET 1	Easy-to-operate basic conductivity benchtop meter for routine measurement. For AC and battery operation. Set including conductivity cell. Meter with universal power supply, stand and operation manual. Incl. 4-electrode graphite conductivity cell TetraCon® 325, 0.01 mol/l KCl conductivity standard.	1CA101
inoLab® Cond 7310 SET 1	Precise and convenient conductivity meter, menu controlled, for measurements/documentation according GLP/AQA. For AC and battery operation. Set including conductivity cell. Meter with universal power supply, stand and operation manual. Incl. 4-electrode graphite conductivity cell TetraCon® 325, 0.01 mol/l KCl conductivity standard, software and USB cable.	1CA301
inoLab® Cond 7310P SET 6	Meter see above, but with integrated thermal printer, in set with pure water USP Kit 1.	1CA306P



For other SETs or measuring cells in SET, see WTW Product Details

Portable Conductivity Meters

Conductivity is measured for many applications. It serves for checking the value limit compliance of drinking water, determines the quality of ultrapure water and also supports the correct determination of the oxygen concentration in sea and brackish water. Portable conductivity systems from WTW are perfect for precise on-site measurements.



Conductivity measurements with the new digital MultiLine® multi-parameter portable meters see page 18



Measuring conductivity securely...
... with the versatile Multi 3410

The single channel multi-parameter portable meter Multi 3410 IDS is ideal for conductivity measurements under all conditions in the field and on site. The IDS technology enables perfect measurements for conductivity, salinity, TDS, specific resistance and also efficient documentation for all measurements. In addition, the Multi 3410 allows connecting additional sensors and parameters.

Multi 3410 ^{IDS}

- Measuring reliability without compromises
- Digital sensor recognition
- Covers the entire conductivity measuring range



Measuring reliability

- The cell constant of the connected measuring cell is automatically transmitted.
- Well-proven basic measuring cells deliver the highest possible precision
- Measuring range between 0.01 µS/cm and 2000 mS/cm

Documentation complying with GLP/AQA

- Automatic digital recording of the complete sensor data for traceability of measuring values
- User administration can be activated for reliable allocation of user, measuring location and measuring result.
- Transfer of all data in .csv format via USB interface onto PC or onto USB memory stick, on demand a formatted export into Excel is possible (MultiLab® Importer, included in the delivery scope or as download)

General Features

Model	Multi 3410 ^{IDS}
Manual data storage	500 data sets/ automatic: 10.000 data sets
Data logger	manual/time scheduled
Interface	USB-A and Mini USB
Power supply	Universal power supply with charging function or 4 x 1.2 V NiMH rechargeable batteries



Ordering Information

MultiLine® ^{IDS}		Order No.
Multi 3410 SET 7	Professional digital multi meter for portable field measurement, with single channel input, color graphic display incl. data logger and USB interfaces. Conductivity case set with digital IDS 4-electrode conductivity cell TetraCon® 925, short instruction manual, stand, beaker, CD-ROM, driver software for USB, rechargeable batteries, cable, universal power supply and accessories.	2FD457
Multi 3410 SET A	Meter see above, but with digital IDS 2-electrode conductivity cell LR 925/01.	2FD45A



For other measuring cells in Sets see WTW Product Details

ProfiLine 3000 Series

Reliable conductivity documentation ...

... with the ProfiLine Cond 3310

The Cond 3310 is a combination of a robust portable meter and a data logger for all who wish to record measuring data automatically and evaluate data on a PC.

ProfiLine Cond 3310

- Waterproof USB interface for fast data transfer
- Data output in .csv format
- Measuring range 0.001 $\mu\text{S}/\text{cm}$ up to 1000 mS/cm

Measuring consistency

- Repeatable measuring results provided by the active, automatic AutoRead function with recognition of stable end values
- Automatic temperature compensation, can be switched-off,
- Linear compensation up to 10 %/K
- Silicone keypad with tangible key click, optional casing for field operation

GLP/AQA compliant documentation

- Large storage for 500 manual and 5000 automatically generated recordings
- Transfer of all data in .csv format via USB interface onto PC,
- On demand formatted export into Excel (MultiLab® Importer included in delivery scope or as download).

Flexible and powerful:

- Measures conductivity, salinity, TDS and specific resistance
- Direct data transfer into Excel
- Also suitable for measurements complying with Pharmacopeia



Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

Measuring conductivity precisely...

... with the ProfiLine Cond 3210

The ProfiLine Cond 3210: A portable and convenient conductivity meter for measuring in varying samples with 2- and 4-electrode measuring cells and changing temperature compensation methods.

ProfiLine Cond 3210

- Convenient user guidance
- Manual storage function
- For all common WTW conductivity cells



Measuring consistency

- Repeatable measuring results provided by the active, automatic AutoRead function with recognition of stable end values
- Automatic temperature compensation, can be switched-off
- Silicone keypad with tangible key click, optional casing for field operation

Documentation

- Storage with output via display or for occasional documentation

Flexible and powerful

- Measures conductivity, TDS, salinity and specific resistance
- Special measuring cells can be connected
- Also suitable for measurements complying with Pharmacopeia

Easy measuring of conductivity...

... with the ProfiLine Cond 3110

The Cond 3110 is an easy-to-use, reliable conductivity meter with automatic nLF temperature compensation complying with DIN EN 27888 for routine measurements in natural water and wastewater.

ProfiLine Cond 3110

- Suitable for TetraCon® 325 or KLE 325
- Automatic temperature compensation
- Salinity



Measuring reliability

- Repeatable measuring results provided by the active, automatic AutoRead function with recognition of stable end values
- Safe operation: Automated functions reduce the number of keys (6)
- Water-resistant 8-pin socket enables reliable measurements also in humid environments.

Easy and reliable:

- High-visibility display for measuring value and temperature
- Silicone keypad with tangible key click, can also be operated with gloves
- For field operation in a case set with the proven electrodes

Technical Data

Model	Cond 3110	Cond 3210	Cond 3310
Range/Resolution/Accuracy	Conductivity 0.0 ... 1000 mS/cm ±0.5% of value Temperature -5.0 °C ... +105.0 °C ±0.1 °C (23 ... 221 °F) Salinity 0.0 ... 70.0 (nach IOT) TDS – Resistivity –	0.0 ... 1000 mS/cm ±0.5% of value 0.000 ... 1.999 µS/cm (for K=0.01 cm ⁻¹) 0.00 ... 19.99 µS/cm (for K=0.1 cm ⁻¹) -5.0 °C ... +105.0 °C ±0.1 °C (23 ... 221 °F) 0.0 ... 70.0 (according to IOT) 0 ... 1999 mg/l, 0 ... 199.9 g/l, 0.00 ... 999 MΩcm	
Reference temperature	20 °C or 25 °C (68 ... 77 °F), selectable	20 °C or 25 °C (68 ... 77 °F), selectable	
Cell constant	fixed: 0.475 cm ⁻¹ with calibration: 0.450 ... 0.500 cm ⁻¹ , 0.800 ... 0.880 cm ⁻¹ adjustable: –	0.475 cm ⁻¹ , 0.010 cm ⁻¹ 0.450 ... 0.500 cm ⁻¹ , 0.800 ... 0.880 cm ⁻¹ 0.090 ... 0.110 cm ⁻¹ , 0.250 ... 25.000 cm ⁻¹	
Temperature compensation	Automatic	Automatic / manually selectable	
Temperature coefficient	• Non-linear function for natural waters (nLF) to EN 27 888	• Non-linear function for natural waters (nLF) to EN 27 888 and ultrapure water function • Linear compensation from 0.000 ... 3.000 %/K • No compensation	• Linear compensation from 0.000 ... 10.000 %/K • No compensation
Memory/Logger	–	Manual 200	Manual 200/5000 automatic
Display	7-Segment LCD, customized	LCD Graphic, backlit	
Continuous operation	Up to 1000 hrs.	Up to 800 hrs. without/100 hrs. with backlight	

Ordering Information

ProfiLine Portable Conductivity Meter SETs	Order No.
Cond 3110 SET 1 Robust and waterproof battery-operated portable conductivity meter, including TetraCon® 325, professional case and accessories	2CA101
Cond 3210 SET 1 Robust and waterproof battery-operated portable conductivity meter with data logger, including TetraCon® 325, professional case and accessories	2CA201
Cond 3310 SET 1 Robust and waterproof battery-operated portable conductivity meter with data logger and USB mini B interface, including TetraCon® 325, professional case and accessories	2CA301



For other measuring cells in SET, see WTW Product Details

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

ProfiLine Conductivity Field Meters

The WTW conductivity meter ProfiLine Cond 1970i, supplied with integrated powerful NiMH rechargeable batteries, is both waterproof (IP 66) and submersible (IP 67). Along with an 800 data file data logger, a real time clock and recorder output, the ProfiLine Cond 1970i conforms to all GLP requirements.

ProfiLine Cond 1970i

- Highly precise, indestructible, waterproof
- Large, silicone keys for field use
- Large, easy-to-read display
- Measurement down to depths of 100 m (330 ft)

Convenient handle and carrying strap included.

The Cond 1970i is suitable for depth measurements down to 100 m (330 ft) in combination with the TA 197 LF depth armature.



TA 197 LF

Conductivity depth armature TA 197 LF with built-in temperature probe, up to 100 m (330 ft) cable with waterproof plug (IP 67), pressure-resistant steel armor (material VA 1.4571) with screw-off protective hood, pressure-resistant to max. 10 bar, fits into small boreholes (2" dia.).



Technical Data

Model		ProfiLine Cond 1970i
Range/ Resolution	Conductivity	0.0 µS/cm ... 500 mS/cm in 5 measuring ranges or AutoRange,, 0.00 ... 19.99 µS/cm for K=0.1 cm ⁻¹ , 0.000 ... 1.999 µS/cm for K=0.01 cm ⁻¹
	Temperature	-5.0 °C ... +105.0 °C (23 ... 221 °F)
	Salinity	0.0 ... 70.0
	TDS	0 ... 1999 mg/l
Accuracy (±1 digit)	Conductivity	±0.5% of value
	Temperature	± 0.1 K
Reference temperature		20 °C or 25 °C (68 ... 77 °F), selectable
Cell constants		With calibration 0.450...0.500 and 0.800...1.200 cm ⁻¹ , fixed: 0.01 cm ⁻¹ freely adjustable 0.25 ... 2.5 cm ⁻¹ and 0.09 ... 0.11 cm ⁻¹
Temperature compensation		Automatic, can be switched off
Temperature coefficient		<ul style="list-style-type: none"> • Non-linear function for natural waters to EN 27 888 coefficient and ultrapure water function • Linear compensation from 0.01 ... 2.99%/K • No compensation

Ordering Information

Portable Conductivity Field Meter – with universal power supply 100-240 VAC (50/60 Hz) included	Order No.
ProfiLine Cond 1970i Robust, waterproof, submersible conductivity meter	3C30-010



For depth armatures down to 100 m (330 ft), see WTW Product Details

VARIO® C_{ond}

- Touch screen
- Large operating range
- Plug-in cells – no cables

Simple measurement at your fingertips – now also available for conductivity measurement

VARIO® C_{ond} is an outstanding value. This economical meter is ideal for use in process control monitoring or anywhere that a small, accurate meter is needed. The VARIO® is small, light, handy, waterproof and has a robust firm-grip rubber armor.

Miniature precision

The globally renowned measurement cell TetraCon® 325 was modified exclusively for the VARIO® C_{ond}. With an extra ultrapure water cell and flow vessel the VARIO® C_{ond} is uniquely suited for ultrapure water analysis.

With increased precision through the omission of cable connectors, the VARIO® C_{ond} is an appropriate solution for servicing and maintaining water treatment equipment. No matter whether using it for pure water measurement in semi-conductor industry or in cell culture laboratories, the pure water conductivity cell with flow-through vessel always allows a rapid and easy control measurement.



Long lasting power.

VARIO® C_{ond} offers up to 500 hours of continuous operation with just one standard battery. The low-power technology shuts down the device after 10 minutes in standby. Changing the battery is quick and easy.

Technical Data

Model	VARIO® C _{ond}	
Range/Resolution	[μS/cm]	0.00 ... 19.99 (when using module LR01 V) 0.0 ... 199.9 0 ... 1999
	[mS/cm]	0.00 ... 19.99 0.0 ... 199.9 0 ... 1999
Resistivity [kΩcm]		0.000 ... 1.999 0.00 ... 19.99 0.0 ... 199.9 0 ... 1999
Resistivity [MΩcm]		0.000 ... 1.999 0.0 ... 199.9 0 ... 1999
	SAL	0.0 ... 70.0 according IOT
	TDS [mg/l]	0 ... 1999
	T [°C/°F]	-5.0 ... +105.0/23 ... 221

The conductivity meter aboard the ISS.



Ordering Information

VARIO® C _{ond}		Order No.
VARIO® C _{ond} SET A	VARIO® C _{ond} in the portable case set, incl. 4-electrode cell and KCl solution 0.01 mol/l	2X00-001A
VARIO® C _{ond} SET B	VARIO® C _{ond} in the portable case set, incl. ultrapure water cell and flow-through vessel	2X00-001B

IP 65



3 Year Warranty

For other accessories, see WTW Product Details

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

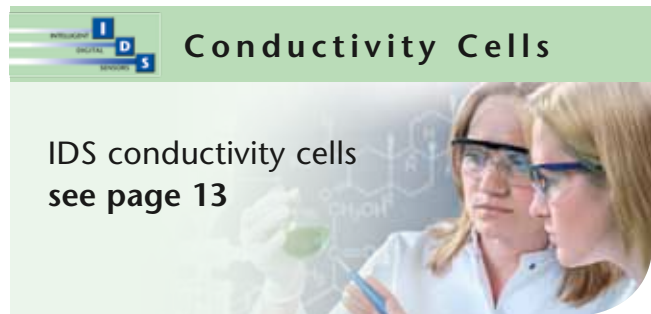
Turbidity

Colony Counter

Software/Printers

Conductivity Cells

The TetraCon® 4-electrode system sets the standard for professional conductivity measurements. When compared to conventional 2-electrode conductivity cell, the TetraCon® cells offer a high degree of precision, wider measuring range and minimal immersion depth needed for measuring. Additionally, these superior cells eliminate errors caused by polarization effects, and from dirty samples.



IDS conductivity cells
see page 13

TetraCon®

In comparison with conventional measuring cells with 2 electrodes, the TetraCon® conductivity cell offers numerous technical advantages:

- Highest degree of precision and linearity by optimized cell geometry
- Extremely large measuring range with just one cell
- Long-term cell constant stability with high-quality abrasion-resistant graphite electrodes
- With built-in temperature probe
- Smallest immersion depth possible
- No measuring errors even with very dirty electrodes – contact resistance on the electrode surface is automatically compensated
- No measuring errors from cable influences
- No measuring errors from primary or secondary polarization effects
- No measuring errors due to contact with side walls or base of measuring vessels
- Robust, unbreakable epoxy body

Selection Guide

Measuring cell	MultiLine® Multi 3410/3420/ 3430/inolab® Multi IDS	Profiline Cond 3110	Profiline Cond 3210/3310	VARIO® C _{ond}	Cond 315i	LF 318	LF 320/323/325	LF 330/340A	Cond 330i/340i	inoLab® Cond, pH/Cond, Multi	LF 3000	MultiLab® 540	MultiLine® P4, Multi 340i, Multi 197i, Multi 1970i	MultiLine® P3 pH/LE, pH/Cond 340i	Multi 350i	LF 197, LF 597	Cond 1970i/197i
KLE 325		●	●														
LTA 1			②			②	②	②	②	②				②	②		②
LR 01/T											●						
TetraCon® 325, TetraCon® 325/C		●	●		●	●	●	●	●	●		●	●	●	●	●	●
^{II} _B TetraCon® 925	●																
TA 197 LF																●	●
TetraCon® DU/T			⑤				⑤	⑤	⑤	⑤	④	⑤			⑤	⑤	⑤
TetraCon® DU/TH			⑤				⑤	⑤	⑤	⑤	④	⑤			⑤	⑤	⑤
LR 325/01			●		●		●	●	●	●		●			●	●	●
^{II} _B LR 925/01	●																
LR 325/001			●					●	●	●		●			●		●
TetraCon® 325/S			●					●	●	●		●			●	●	●
ConOx															●		
TetraCon® V				●													
LR01 V				●													

Adapter (possible conversion with cell constants) is required:

② Adapter cable K/LTA together with temperature probe TFK 325 or TFK 150
 ④ Connection cable KKDU
 ⑤ Connection cable KKDU 325



Conductivity Cells

Application	Standard	Universal		Special	Ultrapure Water		Trace	Flow-through
	KLE 325	TetraCon® 325	TetraCon® V	TetraCon® 325/S	LR 325/01	LR 01 V	LR 325/001	TetraCon® DU/T
Order No.	301 995	301 960	301 990	301 602	301 961	301 992	301 962	301 252**
Electrode material	Graphite	Graphite		Graphite	V4A steel		V4A steel	Graphite
Flow-through vessel	–	–		–	–		V4A steel	–
Shaft material	Epoxy	Epoxy		Epoxy	V4A steel		V4A steel	Epoxy
Shaft length	120 mm (4.72 in)	120 mm (4.72 in)		120 mm (4.72 in)	120 mm (4.72 in)		120 mm (4.72 in)	155 mm (6.10 in)
Cell constant	$K = 0.84 \text{ cm}^{-1}$	$K = 0.475 \text{ cm}^{-1}$		$K = 0.491 \text{ cm}^{-1}$	$K = 0.1 \text{ cm}^{-1}$		$K = 0.01 \text{ cm}^{-1}$	$K = 0.778 \text{ cm}^{-1}$
Diameter	15.3 mm (0.60 in)	15.3 mm (0.60 in)		15.3 mm (0.60 in)	12 mm (0.47 in)		20 mm (0.79 in)	–
Cable length	1.5 m (4.9 ft)	1.5 m (4.9 ft)		1.5 m (4.9 ft)	1.5 m (4.9 ft)		1.5 m (4.9 ft)	1 m (3.3 ft) (only with KKDU 325)
Measuring range	1 $\mu\text{S/cm}$... 20 mS/cm	1 $\mu\text{S/cm}$... 2 S/cm^*		1 $\mu\text{S/cm}$... 2 S/cm^*	0.001 $\mu\text{S/cm}$... 200 $\mu\text{S/cm}$		0.0001 $\mu\text{S/cm}$... 30 $\mu\text{S/cm}$	1 $\mu\text{S/cm}$... 2 S/cm^*
Temperature range	0 ... 80 °C (32 ... 176 °F)	0 ... 100 °C (32 ... 212 °F)		0 ... 100 °C (32 ... 212 °F)	0 ... 100 °C (32 ... 212 °F)		0 ... 100 °C (32 ... 212 °F)	0 ... 60 °C (32 ... 140 °F)
Filling volume	–	–		–	17 ml (without sensor)		ca. 10 ml (without sensor)	7 ml
Min./max. immersion depth	36/120 mm (1.42/4.72 in.)	36/120 mm (1.42/4.72 in.)	40 mm (1.57 in.)	40/120 mm (1.57/4.72 in.)	30/120 mm (1.18/4.72 in.)	40 mm (1.57 in.)	40/120 mm (1.57/4.72 in.)	–

IDS Conductivity Cells see page 13

For additional special measuring cells or other cable lengths, see WTW Product Details

* Measuring range depends on particular instrument

** Adapter cable KKDU 325 (order no. 301 963), length 1 m (3.3 ft), is necessary for the connection

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

Ultrapure Water According to Pharmacopeia

Calibration and testing agents

Kit for ultrapure water according to pharmacopeia

This kit contains LR 325/01 Ultrapure water cell, D01/T flow-through vessel made of glass (USP-KIT 1) or stainless steel (USP-KIT 2), NIST traceable 5 μ S standard with accuracy $\pm 2\%$ and 6R/SET/LabTesting set



Ultrapure water cell LR 325/01 with glass flow-through vessel



Conductivity measuring kit ultrapure water measuring according to pharmacopeia, with stainless steel flow-through vessel for pharmaceutical water.

Calibration standard 100 μ S/cm

Shelf life 2 years,
NIST traceable with accuracy $\pm 3\%$

Calibration standard 5 μ S/cm

Shelf life 1 year,
NIST traceable with accuracy $\pm 2\%$

Ordering Information Calibration and Testing Agents

Kit for measuring the conductivity according to pharmacopeia		Order No.
USP Kit 1	Kit for measuring conductivity according to pharmacopeia, consisting of LR 325/01 Ultrapure water cell, D01/T glass flow-through vessel, NIST traceable 5 μ S standard with accuracy $\pm 2\%$ and 6R/SET/LabTesting set	300 569
USP Kit 2	As USP Kit 1, but flow-through vessel made of stainless steel instead of D01/T	300 568
Calibration agents		Order No.
KS 100 μ S	Calibration standard 100 μ S/cm, shelf life 2 years, NIST traceable with accuracy $\pm 3\%$ (300 ml)	300 578
KS 5 μ S	Calibration standard 5 μ S/cm, shelf life 1 year, NIST traceable with accuracy $\pm 2\%$ (300 ml)	300 580
E-SET Trace	Calibration set (6 x 50 ml bottles calibration and control standard, KCl 0.01 mol/l), NIST traceable with accuracy $\pm 0.5\%$	300 572

Flow-through vessels



Trace conductivity cell LR 325/001 with stainless steel flow-through vessel



Glass flow-through vessel D01/T with ultrapure water cell LR 01 V

Ordering Information Flow-through Vessels		
For LTA 1, LTA, LTA 01 and TFK 530		Order No.
D 530	Flow-through vessel of transparent PVC, suitable for conductivity cells and temperature probes, I.D. 44 mm, V*=97 ml	108 060
For TetraCon® 325		Order No.
D 201	Flow-through vessel of transparent PVC, I.D. 18 mm, V*=13 ml	203 730
For TetraCon® 96, LTA 100 and KLE 1		Order No.
D 1/T	Flow-through vessel, glass I.D. 24 mm, V*=36 ml	302 730
For LR 01/T and LTA 01		Order No.
D 01/T	Flow-through vessel, glass I.D. 18 mm, V*=17 ml	302 750

V* = filling volume without sensor

Parameter
Multi-parameter
pH
ORP
ISE
Dissolved Oxygen (D.O.)
Conductivity
Data logger/flow + level
BOD/Respiration
Photometers
Turbidity
Colony Counter
Software/Printers