

# Lab Sensors



## InLab® electrodes

pH electrodes

Conductivity probes

Dissolved oxygen sensors

ORP electrodes

Ion-selective and gas-sensitive electrodes

Reference electrodes

Electrode cables and accessories

Buffers, electrolytes and cleaning solutions



## Simply reliable

## The right electrode every time

**METTLER TOLEDO**

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### 100% quality control

Each METTLER TOLEDO electrode is individually tested before it leaves our factory. A quality certificate is enclosed with each electrode, which guarantees traceability under ISO 9000. The serial number is engraved in the electrode head to ensure easy identification even after years of use.

### Seven solutions for the No. 1 problem

METTLER TOLEDO offers seven different solutions for the most common problem in pH measurement – the contaminated reference diaphragm.



ARGENTHAL™ reference system with silver-ion trap so that the risk of contamination by sulfides and proteins is completely precluded. See for example InLab®Routine p. 7 or InLab®Micro p. 13.



Movable glass or PTFE ground joint junctions that can be easily yet thoroughly cleaned. See for example InLab®Science p. 7 or InLab®Reference Pro p. 16.



Open connections without junctions together with XEROLYT®- polymer electrolyte. See for example InLab®Expert p. 9, InLab®Solids p. 11 or InLab®Semi-Micro p. 13.



SteadyForce™ reference system with guaranteed electrolyte discharge thanks to the pressurized electrolyte. See InLab®Power p. 9 or InLab®Viscous p. 11.



Dirt-repellent PTFE junctions with a large contact surface. See InLab®Pure p. 13.



Replaceable junctions facilitating the easy replacement of contaminated ceramic junctions. See InLab®Versatile p. 15.



If the ceramic junction of a conventional electrode without ARGENTHAL™ becomes contaminated, METTLER TOLEDO offers a range of cleaning solutions (p. 30).

Which electrode is suitable for which pH applications is clearly presented in the application table on p. 4.

### Irrespective of the industry or application – we have the solution for you

METTLER TOLEDO sensors cover innumerable applications in chemical, pharmaceutical, food-processing, cosmetic, biological and many other laboratory and production facilities.

Select the electrode that matches your requirements from the application table on p. 4 or at [www.mt.com/electrode-guide](http://www.mt.com/electrode-guide).



**INGOLD**  
Leading Process Analytics

INGOLD has been producing electrodes since 1948, a name that has been synonymous with the success of combined pH electrodes ever since. In 1986 INGOLD joined the METTLER TOLEDO group. The result is the development of the InLab® range of laboratory electrodes. InLab® is thus the product of over 50 years of experience in the manufacture of electrochemical sensors. And so the tradition continues with every METTLER TOLEDO sensor: "INGOLD inside"

### Tradition and innovation

The glass membrane represents the heart of a pH electrode. METTLER TOLEDO has been developing special membrane glasses for various applications since 1948. These five types of high quality glass are used in all modern InLab® electrodes:

<b>HA glass</b>	high alkali glass for use at high pH values and high temperatures; extremely low alkali errors; mechanically extremely robust membrane.
<b>LoT glass</b>	low resistance glass for use at low temperatures (LoT = low temperature); also suitable for low ion concentrations (ultra-pure water); the glass of choice for thick membranes (needle or flat membrane electrodes).
<b>A41 glass</b>	particularly resistant to chemicals; suitable for high temperatures up to 130°C; ideal for biological media.
<b>U glass</b>	universal glass, tried & tested in standard applications; especially suitable for small membrane forms (microelectrodes).
<b>HF glass</b>	especially suitable for media containing hydrofluoric acid; up to a HF concentration of 1 g/L.





# Steady companions



"Incredible that glass can be this tough: the membrane in the InLab® Routine is made from extremely tough HA membrane glass and can survive the hardest knocks unscathed. The InLab® Routine is a reliable workhorse in the laboratory. The InLab® Science comes into its own with more complex sample matrices, such as emulsions or biological media. The fact that each of these electrodes comes with its own 25 mL vial of electrolyte considerably facilitates experimental work. This makes starting up so easy with each electrode having enough electrolyte for the first few months of operation."

One prerequisite for accurate measurements is a clean junction. It forms the interface between the reference electrode and the measured medium. If it becomes contaminated, then any measurements will be invalidated by the increased number of diffusion potentials. METTLER TOLEDO offers maximum protection against such inaccuracies: in contrast to conventional electrodes, the electrolyte in InLab® electrodes with an ARGENTHAL™ reference system and silver-ion trap is guaranteed free of silver ions. Thus the possibility of contamination of the junction in sulfide or protein containing media or in TRIS-buffers is precluded.



InLab®	Routine	Routine-L	Routine Pro	Routine Pt1000	Routine Pro-L	Science	Science Pro
Order number	51343050	51343053	51343054	51343056	51343057	51343070	51343071
pH-range	0...14	0...14	0...14	0...14	0...14	0...12	0...12
Temperature probe			NTC 30 kΩ	Pt1000	Pt1000		NTC 30 kΩ
Type of membrane glass	HA	HA	HA	HA	HA	A41	A41
Membrane resistance (25 °C)	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ
Cable and connections	S7	S7	MultiPin™	MultiPin™	1.2 m; DIN 19262/ 4 mm banana gold-plated	S7	MultiPin™
Shaft length	120 mm	170 mm	120 mm	120 mm	170 mm	120 mm	170 mm
Type of junction	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Movable glass sleeve	Movable glass sleeve
Cable kit	51343051 Set InLab® Routine with DIN cable 52300001 51343052 Set InLab® Routine with BNC cable 52300004 51343055 Set InLab® Routine Pro with BNC/RCA (cinch) cable 52300009						
Common specifications	Type of electrode: pH-combination / Shaft material: Glass / Reference electrolyte: 3 mol/L KCl / Temperature range: 0...100 °C Shaft diameter: 12 mm / Reference system: ARGENTHAL™ with silver-ion trap / Storage: 3 mol/L KCl						

# Defying the laws of physics



"The new InLab®Power is simply brilliant: The SteadyForce™ reference system is under over-pressure, guaranteeing electrolyte discharge. The constant but controlled gradual discharge of electrolyte by the ceramic junction ensures extremely reliable and reproducible results. At the same time, there is no need to worry about the junction becoming contaminated ... the SteadyForce™ system always ensures a connection to the measurement medium! Thanks to InLab®Power you can just concentrate on measuring."

Microporous ceramic junctions can become contaminated in critical media. However, InLab® electrodes with solid XEROLYT® polymer electrolyte completely dispense with the need for a junction. With the InLab®Expert, the reference electrode is in direct contact with the measured medium via an open connection. If there is no junction, then there is also no possibility of contamination or blockage!

Ideal for critical samples such as suspensions or samples of unknown composition, e.g. waste water. Furthermore, the PEEK shaft is so chemically and mechanically robust that these electrodes perform reliably under the toughest conditions. One of METTLER TOLEDO's most successful inventions.



InLab®	Expert	Expert Pro	Expert DIN	Expert NTC30	Expert Pt1000	Power	Power Pro
Order number	51343100	51343101	51343103	51343104	51343105	51343110	51343111
pH-range	0...14	0...14	0...14	0...14	0...14	0...12	0...12
Temperature probe		NTC 30 kΩ	Pt1000	NTC 30 kΩ	Pt1000		NTC 30 kΩ
Type of membrane glass	U	U	U	U	U	A41	A41
Membrane resistance (25 °C)	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 600 MΩ	< 600 MΩ
Type of junction	Open junction	Open junction	Open junction	Open junction	Open junction	Ceramic	Ceramic
Reference system	ARGENTHAL™	ARGENTHAL™	ARGENTHAL™	ARGENTHAL™	ARGENTHAL™	SteadyForce™	SteadyForce™
Reference electrolyte	XEROLYT® Polymer	XEROLYT® Polymer	XEROLYT® Polymer	XEROLYT® Polymer	XEROLYT® Polymer	DPA-Gel	DPA-Gel
Cable and connections	S7	1.2 m cable; BNC/RCA (Cinch)	1.2 m cable; DIN 19262/4mm	MultiPin™	MultiPin™	S7	MultiPin™
Shaft material	PEEK	PEEK	PEEK	PEEK	PEEK	Glass	Glass
Shaft length	120 mm	120 mm	120 mm	120 mm	120 mm	120mm	170 mm
Storage	FRISCOLYT-B® (51340053)	FRISCOLYT-B® (51340053)	FRISCOLYT-B® (51340053)	FRISCOLYT-B® (51340053)	FRISCOLYT-B® (51340053)	3 mol/L KCl	3 mol/L KCl
InLab®Expert 2m	The InLab®Expert Pro is also available with a 2m cable: Order number 51343102						
Common specifications	Type of electrode: pH-combination / Temperature range: 0...100 °C / Shaft diameter: 12 mm						

# Nothing is impossible



METTLER TOLEDO offers pH electrodes for all imaginable applications. The InLab® Solids is specially designed to cope with solid samples such as sausages or cheese. And if automatic temperature compensation is required, then the InLab® Solids Pro is the solution. The various lengths of the InLab® Reach, with or without integrated temperature probe, make it possible to measure the most difficult to reach samples. The InLab®Surface has been designed to carry out pH measurements on surfaces, such as paper or skin. It is also ideal for measuring drop-sized samples on glass substrates.

The InLab®Viscous has been especially developed for viscous and highly glutinous samples. The SteadyForce™ reference system guarantees the discharge of electrolytes, even with the most glutinous and fatty of samples, e.g. cosmetics, paints or resins. The form has been chosen so that as little of the sample as possible adheres to the shaft and to facilitate cleaning. The result is a problem solver for one of the most difficult sample types, the highly viscous materials.



InLab®	Solids	Solids Pro	Viscous	490	Reach	Reach Pro	Reach PT1000	Surface
Order number	51343153	51343154	51343150	51302305	51343060	51343061	51343062	51343157
pH-range	1...11	1...11	0...14	0...14	0...14	0...14	1...14	1...11
Temperature range	0...80 °C	0...80 °C	0...100 °C	0...60 °C	0...100 °C	0...100 °C	0...100 °C	0...50 °C
Temperature probe		NTC 30 kΩ		NTC 30 kΩ		NTC 30 kΩ	PT1000	
Type of membrane glass	LoT	LoT	HA	ISFET	HA	HA	HA	LoT
Membrane resistance (25 °C)	< 250 MΩ	< 250 MΩ	< 600 MΩ		< 600 MΩ	< 600 MΩ	< 600 MΩ	< 800 MΩ
Type of junction	Open junction	Open junction	Ceramic	Porous PTFE	Ceramic	Ceramic	Ceramic	ABS-ring
Reference system	ARGENTHAL™	ARGENTHAL™	SteadyForce™	driTEK	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap	Ag/AgCl
Reference electrolyte	XEROLYT®PLUS polymer	XEROLYT®PLUS polymer	FRISCOLYT-C®	Gel	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl AgCl saturated
Cable and connections	S7	MultiPin™	S7	1.0 m cable; Mini-DIN	S7	MultiPin™	MultiPin™	S7
Shaft material	Glass	Glass	Glass	ABS	Glass	Glass	Glass	Polysulfone
Shaft length	25 mm	25 mm	40 mm	160 mm	300 mm	400 mm	400 mm	110 mm
Shaft diameter	6 mm	6 mm	6 mm	10 mm	12 mm	12 mm	12 mm	12 mm
Storage	FRISCOLYT-B® (51340053)	FRISCOLYT-B® (51340053)	3 mol/L KCl	Dry	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl AgCl saturated

Common specifications Type of electrode: pH-combination

# Through thick and thin



"The newly developed InLab®Semi-Micro contains the latest in polymer electrolytes: XEROLYT® EXTRA, which is characterized by high signal stability, a very short response time and high chemical resistance. Service and operation could not be simpler thanks to the polymer electrolyte and the open reference connection. It is the perfect semi-micro electrode for biological media and TRIS buffers, as the question of blockages never arises."

These InLab® electrodes are suitable for small, cold and pure samples, as well as samples containing hydrofluoric acid. All micro and semi-micro electrodes are now equipped with ARGENTHAL™ and a silver-ion trap: This ensures that the electrolyte is silver-ion-free and there is no danger of the junction becoming blocked by sulfides or proteins. The InLab®Micro Pro with integrated temperature sensor supports automatic temperature compensation. With its shaft diameter of only 5 mm it is a little technological marvel. The InLab®Pure has been consciously designed with maximum robustness so that it is also suitable for use in the field or in the factory.



InLab®	Semi-Micro	Semi-Micro-L	Micro	Micro Pro	Cool	Hydrofluoric	Pure	Pure Pro
Order number	51343165	51343161	51343160	51343162	51343174	51343176	51343170	51343171
pH-range	0...12	0...14	0...14	0...14	1...11	1...11	1...11	1...11
Temperature range	0...100 °C	0...100 °C	0...80 °C	0...100 °C	-30...80 °C	0...100 °C	0...80 °C	0...80 °C
Temperature probe				NTC 30 kΩ				NTC 30 kΩ
Type of membrane glass	A41	U	U	U	LoT	HF	LoT	LoT
Membrane resistance (25 °C)	< 300 MΩ	< 300 MΩ	< 600 MΩ	< 300 MΩ	< 50 MΩ	< 100 MΩ	< 150 MΩ	< 50 MΩ
Type of junction	Open junction	Ceramic	Ceramic	Ceramic	immovable glass sleeve	Ceramic	porous PTFE	immovable glass sleeve
Reference system	ARGENTHAL™	ARGENTHAL™ with Ag <sup>-</sup> -trap	ARGENTHAL™ with Ag <sup>-</sup> -trap	ARGENTHAL™ with Ag <sup>-</sup> -trap	ARGENTHAL™ with Ag <sup>-</sup> -trap	ARGENTHAL™ with Ag <sup>-</sup> -trap	Ag/AgCl	ARGENTHAL™ with Ag <sup>-</sup> -trap
Reference electrolyte	XEROLYT®EXTRA Polymer	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	FRISCOLYT-B® (51340053)	3 mol/L KCl	Gel	3 mol/L KCl
Bridge electrolyte								1 mol/L KCl
Cable and connections	S7	S7	S7	MultiPin™	S7	S7	S7	MultiPin™
Shaft material	Glass	Glass	Glass	Glass	Glass	Glass	Polysulfone	Glass
Shaft length	100 mm	230 mm	60 mm	130 mm	120 mm	120 mm	120 mm	170 mm
Shaft diameter	6 mm	6 mm	3 mm	5 mm	12 mm	12 mm	12 mm	12 mm
Storage	3 mol/L KCl AgCl saturated	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	FRISCOLYT-B® (51340053)	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl

Common specifications

Type of electrode: pH-combination

# Robust and cost effective



"The contaminated junction of an InLab®Versatile can be replaced in seconds in a simple procedure. All that is required is the replacement tool and a junction set. It's amazing that something so simple can achieve so much: the electrode is then as good as new!"

These InLab® electrodes offer outstanding value for money. With its maintenance-free gel electrolyte, the InLab®Easy is simplicity itself to operate. The replaceable junction of the InLab®Versatile extends the service life of the electrode by solving the single most common problem: Simply replace contaminated or blocked junctions! The replacement tool (51340267) and the junction set (51340268) can be ordered separately and are not included in the standard delivery of the electrodes.



InLab®	Versatile	Versatile Pro	Easy	Easy BNC	Easy DIN	Basics BNC	Basics DIN
Order number	51343030	51343031	51343010	51343011	51343012	51343020	51343021
Temperature range	0...100 °C	0...100 °C	0...80 °C	0...80 °C	0...80 °C	0...100 °C	0...100 °C
Temperature probe		NTC 30 kΩ					
Shaft material	Polysulfone	Polysulfone	Polysulfone	Polysulfone	Polysulfone	Glass	Glass
Type of membrane glass	U	U	U	U	U	HA	HA
Type of junction	Ceramic (replaceable)	Ceramic (replaceable)	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
Membrane resistance (25 °C)	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 250 MΩ	< 600 MΩ	< 600 MΩ
Reference system	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap	Ag/AgCl	Ag/AgCl	Ag/AgCl	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap
Reference electrolyte	3 mol/L KCl	3 mol/L KCl	Gel	Gel	Gel	3 mol/L KCl	3 mol/L KCl
Cable and connections	1.2 m cable; BNC	1.2 m cable; BNC/RCA (Cinch)	S7	1.2 m cable; BNC	1.2 m cable; DIN 19262	1.2 m cable; BNC	1.2 m cable; DIN 19262
InLab®Easy 3m	The InLab®Easy BNC is also available with a 3 m cable: Order number 51343013						
InLab®Versatile and Versatile Pro	Diaphragm replacement tool for InLab®Versatile and Versatile Pro: 51340267 Replaceable ceramic junctions, set of 10 units: 51340268						
Common specifications	Type of electrode: pH-combination / pH-range: 0...14 / Shaft length: 120 mm / Shaft diameter: 12 mm / Storage: 3 mol/L KCl						

## Useful helpers

### Sometimes two are better than one

pH half-cells are recommended for applications in which the service life of the pH electrode is significantly less than that of the reference electrode.

Moreover in certain highly demanding applications, they achieve better results than combination electrodes as mutual interference is reduced to an absolute minimum. The InLab®Reference Pro is the perfect reference electrode for measurements in ion-selective half-cells (p. 24-26).



InLab®	Mono	Mono Pro	Mono Bridge	Reference	Reference Pro	Reference Flow
Order number	51343195	51343196	51343197	51343190	51434191	51343192
Type of electrode	pH half-cell	pH half-cell	pH half-cell electrolyte bridge			
pH-range	0...14	0...12	0...12			
Temperature range	0...100 °C	0...130 °C	0...130 °C	0...100 °C	0...60 °C	0...130 °C
Type of membrane glass	HA	A41 thick-walled	A41			
Membrane resistance (25 °C)	< 600 MΩ	< 700 MΩ	< 600 MΩ			
Type of junction				Ceramic	Movable PTFE-sleeve	Triple ceramic
Reference system				ARGENTHAL™ with Ag <sup>+</sup> -trap	Ag/AgCl	ARGENTHAL™
Reference electrolyte				3 mol/L KCl	Gel	3 mol/L KCl
Bridge electrolyte					3 mol/L KCl	
Storage	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl			
Common specifications	Shaft material: Glass / Cable and connections : S7 / Shaft length: 120 mm / Shaft diameter: 12 mm					

## Tried and trusted

### Three tried and tested sensors

The SevenGo™ and SevenGo pro™ devices are equipped as standard with high-performance sensors. All three sensors are based on products that have proven themselves a thousand times in practice, combining robustness with precision measuring technology:

**InLab®413 SG** (IP67), a low-maintenance pH electrode with XEROLYT® polymer electrolyte and robust PEEK shaft

**InLab®737** (IP67), a conductivity probe with minimum sample carry-over and maximum linearity

**InLab®605** (IP67), a dissolved oxygen sensor based on precision process analytics of the highest quality



InLab®	413 SG	413 SG/10 m	737	737/10 m	605	605/10 m
Type of electrode	pH-combination		Conductivity cell		Oxygen sensor	
Order number	with 2 m cable 51340288	with 10 m cable 51340289	with 2 m cable 51340277	with 10 m cable 51340278	with 2 m cable 51340291	with 10 m cable 51340292
Compatibility	SevenGo™ SG2 and SG8		SevenGo™ SG3 and SG7		SevenGo pro™ SG6	
Measuring range	0...14		0.05...1000 mS/cm		0...200 % 0...20 mg/L	
Temperature range	0...80 °C		0...105 °C		0...60 °C	
Temperature probe	NTC 30 kΩ		NTC 30 kΩ		NTC 22 kΩ	
Type of membrane glass	U					
Membrane resistance (25 °C)	< 250 MΩ					
Connections	BNC/RCA (Cinch)		LTW		BNC/RCA (Cinch)	
Type of junction	Open junction					
Reference system	ARGENTHAL™					
Reference electrolyte	XEROLYT® Polymer					
Shaft material	PEEK		Epoxy		PPS	
Cell constant			0.60			
Cell type			4 graphite poles			
Storage	FRISCOLYT-B® (51340053)		Dry		Dry	
InLab®605	membrane kit: 51340293 / electrolyte: 51340294					
InLab®740 SG	The InLab®740 is also available with 2m cable and IP67 plug for SevenGo™. Order number 51340283 (see p. 23 for details).					
Common specifications	Shaft length: 120 mm / Shaft diameter: 12 mm					

# Artistry in glass



### Traditional values

These electrodes are part of the INGOLD tradition: there is no pH application for which there is not an optimal technical solution. These electrodes find their application in several somewhat exotic but nonetheless important applications in the food processing, paper and chemical industries. For the LoT402-611-DPA there is a specially developed thermostat controllable container for high precision measurements in automated cycles.



Designation	405-60-T-S7/120/9848	LoT403-M8-S7/120	HA425-60-S7/600	U402-M3-S7/200	403-34-S7/165	HA405-60-M8-S7/400	LoT402-611-DPA-S7/40	Flow-through cell 611
Order number	59904591	59902993	59904764	59904572	59902985	51340262	59902917	59904354
Former Order Number	114053000	104033199	114253000	114023009	104033178		104023528	106111000
pH-range	0...12	1...11	0...14	0...14	0...12	0...14	1...11	
Temperature range	0...100 °C	0...80 °C	0...130 °C	0...80 °C	0...80 °C	0...100 °C	0...80 °C	
Type of membrane glass	A41	LoT	HA	U	A41	HA	LoT	
Membrane resistance (25 °C)	< 600 MΩ	< 1000 MΩ	< 600 MΩ	< 1000 MΩ	< 2000 MΩ	< 600 MΩ	< 250 MΩ	Flow-through cell for electrode
Type of junction	Triple ceramic	ceramic	ceramic	ceramic	Quadruple ceramic	ceramic	Double ceramic	LoT402-611-DPA, thermostatable
Reference system	ARGENTHAL™	Ag/AgCl	ARGENTHAL™	Ag/AgCl	Ag/AgCl	ARGENTHAL™	SteadyForce™	
Reference electrolyte	FRISCOLYT-B®	3 mol/L KCl AgCl saturated	3 mol/L KCl	3 mol/L KCl AgCl saturated	3 mol/L KCl AgCl saturated	3 mol/L KCl	DPA-Gel	
Shaft length	120 mm	120 mm	600 mm	200 mm	165 mm	400 mm	40 mm	Measuring volume approx. 0.5 mL
Shaft diameter	12 mm	8 mm	12 mm	3 mm	12 mm	8 mm	7 mm	
Storage	3 mol/L KCl	3 mol/L KCl AgCl saturated	3 mol/L KCl	3 mol/L KCl AgCl saturated	3 mol/L KCl AgCl saturated	3 mol/L KCl	3 mol/L KCl	

Common specifications pH-combination / Shaft material: Glass / Cable and connections : S7

# High potentials

## Quick response thanks to EQUITHAL®

Temperature changes cause unstable potentials at the lead-off elements. As a consequence, the response time of electrodes is prolonged. In conventional glass electrodes the various elements experience the change at different times, which makes the response behavior even worse.

The lead-off elements of InLab® glass electrodes consist of symmetrical conducting layers on the inner glass tube. Thanks to this equidistant design, the pH and reference potentials stabilize rapidly and simultaneously. The EQUITHAL® technology by METTLER TOLEDO guarantees shortest response times despite large changes in temperature.



InLab®	Redox	Redox-L	Redox Pro	Redox Micro	Redox Au	Redox Ag
Order number	51343200	51343202	51343201	51343203	51343204	51343205
Type of junction	Ceramic	Ceramic	Movable PTFE-sleeve	Ceramic	Ceramic	Ceramic
Reference system	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™	ARGENTHAL™ with Ag <sup>+</sup> -trap	ARGENTHAL™ with Ag <sup>+</sup> -trap
Reference electrolyte	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	1 mol/L KNO <sub>3</sub>
Shaft length	120 mm	170 mm	120 mm	100 mm	120 mm	120 mm
Shaft diameter	12 mm	12 mm	12 mm	6 mm	12 mm	12 mm
Metal	Platinum ring	Platinum ring	Platinum ring	Platinum ring	Gold ring	Silver ring
Storage	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	3 mol/L KCl	1 mol/L KNO <sub>3</sub>
Common specifications	Type of electrode: combined metal electrode / Cable and connections: S7 / Shaft material: Glass / Temperature range: 0...100 °C					



"The problems with ORP samples with a complex composition such as industrial waste water or suspensions are similar to those for pH measurement: a normal ceramic junction becomes blocked and must be cleaned regularly. To facilitate cleaning and increase the electrode's service life when measuring in such critical samples, it is best to use an electrode such as the InLab®Redox Pro. This electrode is equipped with a high quality movable glass junction."

With the six combined ORP electrodes and the four metal half-cells, the full spectrum of applications is covered.

The measuring signal of the redox electrode is generated on the surface of the precious metal by an exchange of electrodes with the oxidation-reduction system of the measuring medium.

Platinum electrodes cover the majority of applications. In the case of highly oxidizing samples, it is best to use a gold electrode. Silver electrodes are primarily used for silver-based electrochemistry, e.g. chloride determination.



Designation	Pt805-S7/120	Au805-S7/120	Ag805-S7/120	Ag850-S7/120
Order number	59904377	59904381	59904391	59904408
Former Order Number	108053117	108053121	108053152	108503079
Temperature range	-30...130 °C	-30...130 °C	-30...130 °C	-30...80 °C
Shaft material	Glass	Glass	Glass	Polypropylene
Metal	Platinum ring	Gold ring	Silver ring	Silver tip

Common specifications Type of electrode: metal half-cell / Cable and connections: S7 / Shaft length: 120 mm / Shaft diameter: 12 mm / Storage: dry

# Ions in motion



Flow cells are recommended for measuring conductivity in pure water or in samples with low conductivity to rule out the falsification of results by carbon dioxide (order no. 51302257).

The InLab®710 to 740 conductivity cells are primarily designed for use in the laboratory. A temperature sensor is integrated in all models to enable correction of the result to the desired reference temperature. All conductivity cells are shipped in a ready-to-use condition and come equipped with plug and cable.

The InLab®730 general purpose conductivity cell is suitable for a variety of applications in aqueous samples over 10 µS/cm. For samples that contain solvents, it is best to use measuring cells that are made of glass and platinum such as the InLab®710 or the InLab®720. With the high-performance InLab®740, samples down to 0.001 µS/cm can be measured.



Designation	InLab®710	InLab®720	InLab®730	InLab®740	950-K19/120/1m/2x-27.4
Order number	51302256	51302255	51302119	51340260	59904438
Former Order Number					109503000
Compatibility	SevenEasy™, SevenMulti™ FiveEasy™, FiveGo™	SevenEasy™, SevenMulti™ FiveEasy™, FiveGo™	SevenEasy™, SevenMulti™ FiveEasy™, FiveGo™	SevenEasy™, SevenMulti™	Instruments from other manufacturers
Measuring range	0.01...500 mS/cm	0.1...500 µS/cm	0.01...1000 mS/cm	0.001...500 µS/cm	
Temperature range	0...100 °C	0...100 °C	0...100 °C	0...70 °C	0...60 °C
Shaft material	Glass	Glass	Epoxy	PVC/Steel V4A	Polysulfone
Cell constant	0.80	0.06	0.56	0.08	1.00
Cell type	4 platinum poles	2 platinum poles	4 graphite poles	2 steel poles	2 platinum poles
Cable and connections	1 m; Mini-DIN	1 m; Mini-DIN	1 m; Mini-DIN	1 m; Mini-DIN	1 m; 4 mm banana
InLab®730/2 m	The InLab®730 is also available with a 2m cable. Order number 51340275				
Common specifications	Type of electrode: Conductivity cell / Shaft length: 120 mm / Shaft diameter: 12 mm				

# Precise determinations



"This way you can just as easily use your ISE with a titrator as with an ion-meter. Every time you change the membrane module you simply change your ID ring."

### Modular and versatile

METTLER TOLEDO ion-selective half-cells (exception: Sodium-sensitive electrode) consist of two elements: a universal shaft and an ion-specific membrane module. This module may be exchanged allowing you to measure the ion of your choice. Just order the membrane kit specific for that ion, mount the new module onto the shaft of your ISE half-cell, and you have a new ISE! What is more, the membrane kit also comes with an identification ring (ID ring) and an adapter sleeve which will fit any METTLER TOLEDO titration stand.

Designation	DX207-Li <sup>+</sup>	DX218-NH <sub>4</sub> <sup>+</sup>	DX219-F	DX223-Na <sup>+</sup>	DX226-CN <sup>-</sup>	DX232-S <sub>2</sub>
Order number electrode	51107673	51340900	51340500	51340263	51107681	51107675
Order number membrane kit	51107687	51340012	51340008		51107695	51107689
Order number electrolyte	51107881	51340035	51340031		51107893	51107894
Shaft material	POM/PVC	POM/PVC	POM	Glass	POM	POM
Optimal pH range	2...12	2...9	4...10	8...11	4...13	4...13
Type of membrane	Polymer	Polymer	Solid state	Na-glass	Solid state	Solid state
Measuring range	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-7</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L
Temperature range	0...50 °C	0...50 °C	0...80 °C	0...80 °C	0...80 °C	0...80 °C
Electrolyte for reference electrode	3 mol/L KCl	2 mol/L MgSO <sub>4</sub>	3 mol/L KCl	3 mol/L KCl	1 mol/L KNO <sub>3</sub>	1 mol/L KNO <sub>3</sub>
ISA-solution (Ionic Strength Adjuster)	0.5 mol/L MgSO <sub>4</sub>	0.5 mol/L MgSO <sub>4</sub>	TISAB III	0.9 mol/L Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	10 mol/L NaOH	10 mol/L NaOH

Common specifications Type of electrode: ion selective half-cells

Designation	DX235-Cl <sup>-</sup>	DX239-K <sup>+</sup>	DX240-Ca <sup>2+</sup>	DX258-SCN <sup>-</sup>	DX262-NO <sub>3</sub> <sup>-</sup>	DX264-Cu <sup>2+</sup>	DX280-Br <sup>-</sup>
Order number electrode	51340400	51340700	51340600	51107870	51340800	51107678	51340300
Order number membrane kit	51340007	51340010	51340009	51107871	51340011	51107692	51340006
Order number electrolyte	51340030	51340033	51340032	51107872	51340034	51107889	51340029
Shaft material	POM	POM/PVC	POM/PVC	POM	POM/PVC	POM	POM
Optimal pH range	2...13	2...12	2...12	2...10	2...12	2...8	2...13
Type of membrane	Solid state	Polymer	Polymer	Solid state	Polymer	Solid state	Solid state
Measuring range	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L
Temperature range	0...80 °C	0...50 °C	0...50 °C	0...80 °C	0...50 °C	0...80 °C	0...80 °C
Electrolyte for reference electrode	1 mol/L KNO <sub>3</sub>	2 mol/L MgSO <sub>4</sub>	2 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	2 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	1 mol/L KNO <sub>3</sub>
ISA-solution (Ionic Strength Adjuster)	1 mol/L KNO <sub>3</sub>	0.5 mol/L MgSO <sub>4</sub>	0.5 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	0.5 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	1 mol/L KNO <sub>3</sub>

Common specifications Type of electrode: ion selective half-cell

# Precise determinations

## Saves time and money

Gas-sensitive electrodes (GSE's) make the determination of concentrations and activity levels in gases simplicity itself. Time and equipment outlays for analyzing gas-sensitive electrodes are extremely low.

The standard GSE is the ammonia electrode. This can easily be adapted to determine other gases. Besides the Ammonia GSE, all that is required is the correct electrolyte for measuring the gas in question. The membrane modules are always the same:

<b>Nitrogen oxides:</b>	NH <sub>3</sub> electrode	51341000
	NO <sub>x</sub> electrolyte	51340037
<b>Carbon dioxide:</b>	NH <sub>3</sub> electrode	51341000
	CO <sub>2</sub> electrolyte	51340038



## The perfect quality

"Each ion-selective electrode (ISE) and each membrane module has been tested for wet-chemistry applications. It has to pass the stringent requirements of several direct measurements as well as a typical titration application. Each ISE is issued with its own serial number and quality certificate. There is no better quality assurance than this. The METTLER TOLEDO ISE's are delivered in the same condition, as they were when tested. Therefore, they are already filled with electrolyte and ready for use."



Designation	DX287-BF <sub>4</sub> <sup>-</sup>	DX312-Cd <sup>2+</sup>	DX327-I <sup>-</sup>	DX337-Ba <sup>2+</sup>	DX407-Pb <sup>2+</sup>	Ammonia
Order number electrode	51107676	51107672	51107680	51107674	51107873	51341000
Order number membrane kit	51107690	51107686	51107694	51107688	51107874	51340013
Order number electrolyte	51107890	51107891	51107898	51107892	51107875	51340036
Shaft material	POM/PVC	POM/PVC	POM	POM/PVC	POM/PVC	PPS
Optimal pH range	2...12	2...8	1...13	2...12	2...8	> 11
Type of membrane	Polymer	Polymer	Solid state	Polymer	Polymer	
Measuring range	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	5·10 <sup>-2</sup> ...10 <sup>-6</sup> mol/L
Temperature range	0...50 °C	0...50 °C	0...80 °C	0...50 °C	0...50 °C	0...50 °C
Electrolyte for reference electrode	2 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	1 mol/L KNO <sub>3</sub>	3 mol/L KCl	1 mol/L KNO <sub>3</sub>	
ISA-solution (Ionic Strength Adjuster)	0.5 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>	1 mol/L KNO <sub>3</sub>	1 mol/L TRIS-2 HCl	1 mol/L KNO <sub>3</sub>	
Interferences						volatile bases

Common specifications

Type of electrode: ion selective half-cell

Designation	DC218-NH <sub>4</sub> <sup>+</sup>	DC219-F <sup>-</sup>	DC235-Cl <sup>-</sup>	DC239-K <sup>+</sup>	DC240-Ca <sup>2+</sup>	DC262-NO <sub>3</sub> <sup>-</sup>	DC280-Br <sup>-</sup>
Order number	51340910	51340510	51340410	51340710	51340610	51340810	51340310
Shaft material	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy	Epoxy
Optimal pH range	4...10	5...8	2...12	2...12	3...10	2...11	2...12
Type of membrane	Polymer	Solid state	Solid state	Polymer	Polymer	Polymer	Solid state
Measuring range	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L	10 <sup>0</sup> ...10 <sup>-5</sup> mol/L	10 <sup>0</sup> ...10 <sup>-6</sup> mol/L
Temperature range	0...50 °C	0...80 °C	0...80 °C	0...50 °C	0...50 °C	0...50 °C	0...80 °C
Electrolyte for reference electrode	2 mol/L MgSO <sub>4</sub>	3 mol/L KCl	1 mol/L KNO <sub>3</sub>	2 mol/L MgSO <sub>4</sub>	2 mol/L MgSO <sub>4</sub>	2 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>
ISA-solution (Ionic Strength Adjuster)	0.5 mol/L MgSO <sub>4</sub>	TISAB III	1 mol/L KNO <sub>3</sub>	0.5 mol/L MgSO <sub>4</sub>	0.5 mol/L MgSO <sub>4</sub>	0.5 mol/L MgSO <sub>4</sub>	1 mol/L KNO <sub>3</sub>

Common specifications

Type of electrode: ion selective electrode (ISE) with built-in reference

































# Plug 'n play...

Connection	Length	Designation	Plug	Socket on the meter	Order number
	1.2 m	BNC/RCA (Cinch)			52300009
	2.5 m	BNC/RCA (Cinch)			51340290
	1.2 m	BNC/1x4 mm			52300011
	1.2 m	DIN/RCA (Cinch)			52300007
	1.2 m	DIN 19262/1x4 mm			52300005
	5 m	DIN 19262/1x4 mm			52300139
	1.2 m	BNC			52300004
	1.2 m	DIN 19262			52300001
	1.2 m	DIN 19262 gold plated			52300036
	1.2 m	Radiometer type 7			52300013
	1.2 m	US-Standard			52300014
	1.2 m	BNC (IP67)			52300046
	1.2 m	no connector			52300025
	5.0 m	DIN 19262 gold plated			52300037
	5.0 m	no connector			52300002

### Universal

METTLER TOLEDO pH, ORP, ion-selective and reference electrodes are not manufacturer-specific and can easily be connected to various third-party instruments. All you have to do is select the appropriate cable. We offer a very wide choice of cable lengths and plug combinations.

You can obtain information about METTLER TOLEDO's modern Seven instrument series at [www.mt.com/pH](http://www.mt.com/pH) or from the separate instrument brochure 51724337.

Connection	Length	Designation	Plug	Socket on the meter	Order number
	1.2 m	4 mm banana			52300015
	1.2 m	2 mm banana			52300016
	1.2 m	RCA (Cinch)			51343314
	1.0 m	BNC			59902392
	1.0 m	DIN 19262			59902382
	1.0 m	4 mm banana			59902434
	1.0 m	Radiometer type 7			59902390
	1.0 m	Lemo 00 (Metrohm)			59902398
	3.0 m	BNC			59902417
	3.0 m	DIN 19262			59902408
	3.0 m	Radiometer type 7			59902416
	3.0 m	Lemo 00 (Metrohm)			59902409
	3.0 m	no connector			59902414
	5.0 m	BNC			59902427
	5.0 m	DIN 19262 gold plated			52300037
	5.0 m	DIN 19262 detachable			59902425
10.0 m	no connector			59902431	

# Amazing solutions



### Buffer solutions with a quality inspection certificate

Any pH-measurement is only as accurate as the buffer solution used for calibration purposes. The internationally recognized pH-scale is based on standard reference materials (SRM) selected by NIST (National Institute of Standards and Technology, USA). METTLER TOLEDO buffer solutions are traceable to these primary standards and come with a quality inspection certificate, which guarantees the stated values and traceability. They are particularly suitable, therefore, for use in quality assurance systems.

Download your detailed test certificate at [www.mt.com/buffer](http://www.mt.com/buffer)



Buffers, standards	pH-Value at 25 °C	Order number 250 mL	Order number 6 x 250 mL	Order number 1000 mL	Order number 30 sachets 20 mL
Standard pH	2.00	51340055			
buffer solutions	4.01	51340057	51340058	51340228	51302069
	7.00	51340059	51340060	51340229	51302047
	9.21	51300193	51300194	51340230	51302070
	10.00	51340056	51340231	51340232	51302079
	11.00	51340063			
	Rainbow I (3 x 10 sachets 20 mL 4.01 / 7.00 / 9.21)				51302068
	Rainbow II (3 x 10 sachets 20 mL 4.01 / 7.00 / 10.01)				51302080
pH buffer solutions	4.006	51340039			
NIST and DIN 19266	6.865	51340041			
	9.180	51340042			
	10.012	51340044			
DKD-certified buffer solutions	4.01	52118093	51319059		
	7.00	52118094	51319060		
	9.21	52118095	51319061		
	10.00	52118096	51319062		
	<b>E (Ag/AgCl) 25 °C</b>			<b>Order number 250 mL</b>	<b>Order number 6 x 250 mL</b>
Redox buffer solutions	220 mV U <sub>H</sub> = 427 mV			51340065	51340081

### Electrolytes for reference electrodes

	Order number 25 mL	Order number 250 mL	Order number 6 x 250 mL
KCl-solution 3 mol/L for ARGENTHAL™ reference systems	51343180	51340049	51340050
KCl-solution 3 mol/L, AgCl saturated, for Ag/AgCl reference systems	51343184	51340045	51340046
FRISCOLYT-B®, for measurement at low temperature and for media with organic compounds (oil, proteins etc.)	51343185	51340053	51340054
LiCl Solution 1 mol/L in ethanol, for measurement in non-aqueous media		51340052	

### Solutions for ion-selective and gas-sensitive measurements

		Order number 250 mL	Order number 6 x 250 mL
Bridge electrolyte			
1 mol/L KNO <sub>3</sub>	51343182	51340047	51340234
3 mol/L KCl	51343180	51340049	51340050
1 mol/L KCl	51343181		
ISA-solutions			
TISAB 3, for fluoride determinations		51340064	
0.9 mol/L Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>		51340072	

### Cleaning solutions

	Order number 250 mL	Order number 6 x 250 mL
Pepsin-HCl for cleaning junctions with protein contamination. Treatment time about 1 h.	51340068	51340069
Thiourea solution for cleaning junctions with silver sulfide contamination. Treatment until discoloration.	51340070	51340082
Reactivation solution for regeneration of glass electrodes. Treatment time about 1 min. (25 mL)	51340073	

### Conductivity standards

	Order number 500 mL	Order number 6 x 250 mL	Order number 250 mL	Order number 30 sachets 20 mL
84 µS/cm	51302153			
1413 µS/cm		51300259	51300138	51302049
12.88 mS/cm		51300260	51300139	51302050

### Accessories

Accessories	Description	Order number
Wetting caps (Minimum order amount 5 units)	For electrodes with shaft diameter 12 mm	59900362
	For electrodes with movable sleeve junction	59900364
	For electrodes with shaft diameter 8 mm and InLab®Solids / InLab®Solids Pro	59900363
	For electrodes with shaft diameter 6 mm	52000442
Separate temperature sensors	For electrodes with shaft diameter 3 mm	52000443
	InLab® NTC 30 kΩ laboratory temperature sensor in glass shaft (120 x 12 mm), with quality certificate	51343310
	InLab® Pt1000 laboratory temperature sensor in glass shaft (120 x 12 mm), with quality certificate	51343312
	NTC 30 kΩ laboratory temperature sensor in stainless steel (120 x 3 mm), steel 316	51300164
	Pt1000 laboratory temperature sensor in stainless steel (120 x 3 mm), steel 316	51300165
	IP67 temperature sensor for MP120/125/MA130 (120 x 3 mm)	51302034
Storage vial	IP67 needle temperature sensor for MP120/125/MA130	51302036
	Vial for storage of pH electrodes	51343320
SafeLock™	SafeLock™ (5 pcs.)	51343315

# METTLER TOLEDO

a world of possibilities ...

... everything and much more



The innovative electronic engineering of the Seven line has been combined with INGOLD's 50 years of experience in producing electrochemical sensors.

**METTLER TOLEDO is a system supplier for pH, conductivity, dissolved oxygen and ion measurements:**



- Seven – state of the art range of instruments
- Five – meter portfolio with excellent value for money
- Comprehensive range of electrodes
- Useful accessories



## METTLER TOLEDO gone global...

the contact addresses of METTLER TOLEDO representatives globally can be found under the Internet address [www.mt.com/contacts](http://www.mt.com/contacts)

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