The ideal set for reliable readings:
SCHOTT Instruments laboratory pH meters
with ScienceLine combination electrodes

Contents laboratory electrodes

Process electrodes

For information about our comprehensive range of products for process analytics, please consult our "Process Electrodes" catalog, which we will send to you at your request.

Tips and information for successful measuring

Storage

Store pH and redox electrodes in the solution for filling the reference electrodes (immerse up to diaphragm). In most cases this is a KCl solution (3 mol/l Type No. L300). Low maintenance electrodes should also be stored in a KCl solution. Conductivity measuring cells can be stored in a dry location after cleaning and rinsing with distilled water.

Measuring

Open the refill opening on refillable pH and redox electrodes before performing measurements. Immerse the sensor into the medium to be measured at least up to the diaphragm. When using refillable sensors pay attention to the electrolyte fill level (see refilling). Rinse the sensor with distilled water between measurements, however do not wipe off. Carefully dab off excess drops.

Calibration

For quality relevant pH measurements it is necessary to calibrate and, if necessary, adjust the pH measuring equipment using buffer solutions to ensure that they meet the requirements for measuring accuracy. If buffer solutions are taken from a bottle, ensure that the bottle is reclosed immediately after removal. Never return the used buffer solution to the bottle, always throw it away. DIN buffer solutions in ampoules are recommended for higher quality requirements, because such ampoules always contain fresh, single portions of the solution. Redox sensors are not calibrated. They can be checked for proper function using appropriate test solutions. The cell constant of conductivity measuring cells should be checked at regular intervals with test solutions and readjusted, if required. Major deviations in the cell constants indicate soiling or damage. It may be recommendable to replate the platinum electrode.

Refilling

Refillable pH and redox sensors should be

filled with electrolyte solution so that the fill level of the electrolyte solution is at least 5 cm above the level of the medium to be measured. BlueLine electrodes can be refilled simply by pumping electrolyte solution into them with a small dispensing bottle (cf. Fig.).

Cleaning

Empty the soiled reference electrode, rinse with electrolyte solution and refill with electrolyte solution. When soiled, glass membranes or diaphragms should be cleaned to maintain the measuring function. Depending on the degree of contamination submerge only the glass membrane or the glass membrane and diaphragm in the cleaning solution. Ensure that any cleaning agent, which has leaked into the electrode, does not come into contact with the reference system; if necessary rinse out the reference electrode with electrolyte solution. We recommend the methods listed below depending on the degree of contamination.

After cleaning rinse off the sensor with distilled water and condition it for one hour or longer in electrolyte solution. Recalibrate the measuring equipment before performing further tests.

Contamination	Treatment	Remarks
Inorganic adhering substances	Several minutes with substances such as HCl 0.1 mol/l or NaOH 0.1 mol/l	Better cleaning action when solution is warm (40 - 50 °C).
Organic substances (oils, greases,...)	Rinse with suitable organic solvent (e.g. ethanol, acetone, etc.) or tenside solution	Observe resistance of plastic shaft to chemicals; Sensor can also be wiped off with a soft, moist rag.
Proteins	Approx. 1 hour with pepsin/HCl solution (type No. L 510)	
Sulfides (on ceramic diaphragm)	With thiocarbamide/HCl solution (7.5% in HCl 0.1 mol/l) until color is removed	Cause: Reaction between electrolyte and solution to be measured. Remedy: Electrodes with platinum diaphragm and Ag^+-free electrolyte.

pH glasses/diaphragms

Different applications require appropriate, especially matched pH electrodes.
You can select the electrode with the optimum pH glass and diaphragm for your specific application.

pH glass

SCHOTT Instruments electrodes are manufactured using various types of pH glasses. These have been optimized for your application and offer high measuring accuracy and reliability. Select the right pH glass for your application:

pH-Gläser	
N-glass:	for general applications over the entire pH range.
A-glass:	with short response time in drinking water, service water and wastewater, for general applications and in media with low ion content.
L-glass:	for low temperatures and general applications.
H-glass:	for high temperatures; in acid and alkaline range, even with high sodium ion concentrations.
S-glass:	in hot alkaline media with good reproducibility and short response times. For process electrodes.

Diaphragms

Selection of an electrode with a suitable diaphragm is an important factor for reliable and reproducible pH measurement:

Diaphragm:	
Platinum diaphragm:	for precision measurement, universal, shows its strength particularly with solutions containing solids and extreme pH values and temperatures. Ideal for titration and very insensitive to stirring.
Ceramic diaphragm:	robust for general applications. Low electrolyte outflow rate.
Ground joint diaphragm:	easy to clean, preferred for liquids with high quantities of solids, suspensions, emulsions, creams and low ion mediums. High electrolyte outflow rate.
Fibre diaphragm:	robust, minimum maintenance electrodes. Preferred for general applications and field measurements.
KPG®-annular gap diaphragm:	On minimum maintenance electrodes with Referid® polymer electrolyte. Symmetrical annular gap, insensitive to soiling, low flow sensitivity, low immersion depth.

The platinum diaphragm developed by SCHOTT gives electrodes particularly constant and reproducible measuring characteristics.

It consists of twisted platinum wires potted into the glass shaft of the electrode. The defined intermediate space between the platinum wires ensures a continuously uniform electrolyte flow rate in all mediums and at all temperatures, which remains constant over the entire service life of the electrode.

Recommended applications for ScienceLine laboratory electrodes (also applies to derived ID versions)

Application/measuring medium	Recommended electrodes	Description	Page
General	N 61	wide range of application	48
	A 161, N 1051 A	wide range of applications, integrated temperature sensor	44/50
Ammonia	NH 1100	universal	62
Insert measurements	L 6880	refillable	52
	L 8880	low maintenance	52
	N 5800 A	refillable, micro-electrode	52
	N 48 A	refillable, robust	52
	N 1048 A,	refillable, robust, integrated temperature sensor	52
Mediums with low-ion content	N 61	platinum diaphragm, high speed	48
	N 64	ground joint diaphragm, higher KCl flow rate	48
	A 164	ground joint diaphragm, higher KCl flow rate, integrated temperature sensor	44/50
Small trial quantities, small vessels (e.g. ampoules, bulbs)	N 5800 A	micro-electrode for insert type measurement	52
	N 5900 A	micro-electrode	52
	N 6000 A	micro-electrode, 0.1 ml solution and higher	46/52
	N 6003	micro-electrode for NMR tubes	52
	A 157	micro-electrode with integrated temperature sensor	46/52
Portable Knick pH Meter (knick electrode head)	N 50 A	pH combination electrode	48
	N 1050 A	same as N 50 A, integrated temperature sensor	50
Alkaline solutions, acids (strong)	H 61	extreme pH values, also high temperatures	48
	H 161	extreme pH values, also high temperatures, integrated temp. sensor	44/50
Conductivity measurement	LF 613 T	universal	60
	LF 713 T	organic solutions, acids (particularly H_2SO_4)	60
	LF 413-3 T	universal, 4-pole graphite sensor	44/60
Sodium	Na 61	universal	62
Surface measurements	L 39	refillable, plastic shaft	46/52
Redox potentials	Pt 6880	general measurements	54
Oxygen	Ox 1100+	universal, galvanic electrode	62
	9009/61	universal, amperometric electrode	62
Wastewater with high quantities of suspended matter, suspensions	N 64	normal conditions	48
	A 164	normal conditions, integrated temperature sensor	44/50
	H 64	also high temperatures, extreme pH values	44/48
Titration	N 62	pH general, refillable	48
	N 61 eis, N 6480 eis	pH non-aqueous, electrolyte LiCl/glacial acetic acid	48
	A 7780	pH general, low maintenance	44/48
	A 162	pH general, refillable, integrated temperature sensor	50
	N 6480 eth	pH non-aqueous electrolyte LiCl/ethanol	48
	AgCl 62	halogenide ions	54
	KF 1100	Karl-Fischer titration	56
	Ca 1100 A	Ca/Mg total hardness	62
	Cu 1100 A	complexometric metal titration	62
	F 1100 A	fluoride titration	62
	Pb 1100 A	sulfate titration	62
	Pt 1200, Pt 1400	double Pt electrode for dead-stop titration	56
	Pt 6280, Pt 6580	redox titration general	54
	Pt 5901	redox tritration (COD)	54
Tris buffer	N 6250	calomel reference	48

Suitable electrodes for other applications are given in the corresponding chapters.

ScienceLine: A maximum of adaptability for all your applications

Only ScienceLine electrodes offer these advantages:

While the BlueLine electrodes were developed as reliable sensors for a series of standard tests, the ScienceLine electrodes have proven themselves million of times over as heavyduty laboratory electrodes from SCHOTT Instruments for practically all applications in the laboratory and in the field.

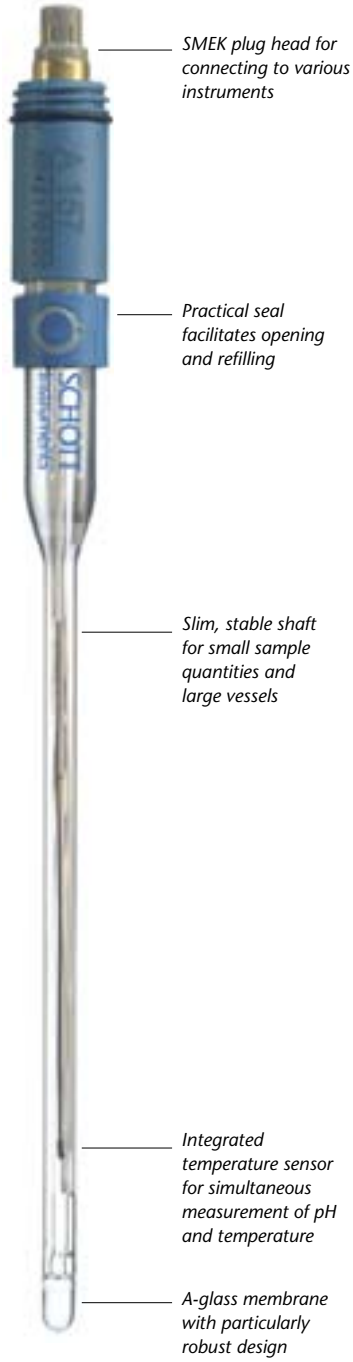
ScienceLine electrodes not only offer you maximum measuring accuracy and measuring consistency – with optimum sensor service life – but also a maximum of adaptability for all your applications, even at high temperatures.

A few examples:

- With ScienceLine electrodes you have a larger selection of diaphragms, e. g. including the annular gap diaphragm which has proven itself exceptionally in the process field and is combined with the Referid® electrolyte in the L 8280.
- The ScienceLine electrodes offer you a larger selection of microelectrodes for particularly small sample quantities and small vessels as well as a variety of electrodes for insert-type tests also with liquid electrolyte, for example the L 6880.
- With ScienceLine electrodes, more types of membrane glass are available, including H-glass, which has a very high accuracy even in the highly alkaline range and is particularly suitable for measurements at high temperature.
- The ScienceLine also offers electrodes with extreme lengths up to 500 mm, which allow measurements in very deep vessel and test tubes.
- ScienceLine offers a large selection of metal electrodes for Redox potential measurements and titration.
- The ScienceLine also offers sensors for other parameters such as ammonia, sodium and oxygen.
- A large number of ScienceLine electrodes are already equipped with a temperature sensor. Many sensors have the SMEK plug head, which allows connection of the electrodes to various measuring instruments using the large selection of plug/cable combinations.
- For particularly demanding measuring applications, the ScienceLine also offers the possibility of using separate measuring and reference electrodes to fully utilize the longer service life of the glass electrodes for more economic testing.

More versatile, faster, more practical!

For example: the new Micro electrode A 157



Better safe than sorry...

ID Electrodes for pH measurement with fixed cable and integrated electrode recognition

Shaft material: glass
Zero point: pH = 7.0 ±0.3
pH range: 0 ... 14
Reference system: Silamid®
Reference electrolyte: KCl 3 mol/l, gel or Referid®
Fixed cable: 1 m long, with DIN or BNC plug

BlueLine 14 pH ID
BlueLine 15 pH ID

A 7780 1M-DIN-ID
A 7780 1M-BNC-ID

H 64 1M-DIN-ID
H 64 1M-BNC-ID

A 161 1M-DIN-ID
A 161 1M-BNC-ID

H 161 1M-DIN-ID
H 161 1M-BNC-ID

A 164 1M-DIN-ID
A 164 1M-BNC-ID

ID Electrodes for conductivity measurement with fixed cable, integrated temperature sensor and integrated electrode recognition

Temperature sensor: NTC 30 KΩ
Fixed cable: 1 m long, with DIN or BNC plug, 8 pole plug

LF 313 T-ID

LF 413 T-ID

LF 913 T-ID

LFOX 1400 ID

… Electrodes automatically identified

Order No.	Type No.	Length L [mm]	Ø [mm]	pH-glass	Temp. range [°C]	Remarks
pH combination electrodes						
285129440	BlueLine 14 pH ID[2)]	120	12	A	-5...+100 °C	Platinum diaphragm, conical membrane, DIN- + 4 mm plug
285129450	BlueLine 15 pH ID[2)]	120	12	A	-5...+100 °C	Platinum diaphragm, conical membrane, BNC- + 4 mm plug
285130240	A 161 1M-DIN-ID[1)]	170	12	A	-5 … +100	Platinum diaphragm, sperical membrane, DIN plug
285130250	A 161 1M-BNC-ID[1)]	170	12	A	-5 … +100	Platinum diaphragm, sperical membrane, BNC plug
285130280	A 164 1M-DIN-ID[1)]	170	12	A	-5 … +100	Ground joint diaphragm, spherical membrane, DIN plug
285130290	A 164 1M-BNC-ID[1)]	170	12	A	-5 … +100	Ground joint diaphragm, spherical membrane, BNC plug
285130200	A 7780 1M-DIN-ID	120	12	A	-5 … +80	3 x ceramic diaphragm, spherical membrane, DIN plug
285130210	A 7780 1M-BNC-ID	120	12	A	-5 … +80	3 x ceramic diaphragm, spherical membrane, BNC plug
285130220	H 64 1M-DIN-ID	170	12	H	+10 … +100	Ground joint diaphragm, spherical membrane, DIN plug
285130230	H 64 1M-BNC-ID	170	12	H	+10 … +100	Ground joint diaphragm, spherical membrane, BNC plug
285130260	H 161 1M-DIN-ID[1)]	170	12	H	+10 … +100	Platinum diaphragm, sperical membrane, DIN plug
285130270	H 161 1M-BNC-ID[1)]	170	12	H	+10 … +100	Platinum diaphragm, sperical membrane, BNC plug

Order No.	Type No.	Length L [mm]	Ø [mm]	Cell const. [cm^{-1}]	Temp. range [°C]	Remarks
ID Electrodes for conductivity measurement with fixed cable, integrated temperature sensor and 8 pole plug						
285130300	LF 313 T-ID	120	12	0.1	0...+100	Ultrapure water conductivity cell with flow-through vessel, stainless steel shaft, sensor stainless steel, fixed cable 1.5 m.
285130310	LF 413 T-ID	120	15.3	0.475	-5 … +80	Plastic shaft, sensor 4 x graphite, fixed cable 1.5 m, measuring range 0 µS/cm ... 2000 mS/cm
285130320	LF 913 T-ID	120	12	0.650	-30 ... +135	5-pole conductivity measuring cell, glass shaft, sensor 5 platinum rings, fixed cable 1 m.
285130330	LFOX 1400 ID	145	15.3	0.475	0...+50	Combined 4-pole conductivity cell and galvanic D.O. sensor LFOX 1400 ID, plastic shaft, conductivity sensor graphite, fixed cable 3 m.

[1)] with integrated temperature sensor Pt 1000
[2)] with integrated temperature sensor NTC 30 kOhm

ID Electrodes for special pH applications

ID Electrodes for pH measurement with fixed cable and integrated electrode recognition

Micro, spear tip and surface pH combination electrodes

Shaft material:	glass (except L 39 and BlueLine 21: plastic shaft)
Zero point:	pH = 7.0 ±0.3
pH range:	0 ... 14 (except L 39, BlueLine 21 and 27: 1 ... 13 pH)
Reference system:	Silamid®, silver/silver chloride
Reference electrolyte:	KCl 3 mol/l, gel or Referid®
Fixed cable:	1 m long, with DIN or BNC plug as well as plug for temperature sensor

BlueLine 21 pH 1M-DIN-ID
BlueLine 21 pH 1M-BNC-ID

L 6880 1M-DIN-ID
L 6880 1M-BNC-ID

N 1048 1M-DIN-ID
N 1048 1M-BNC-ID

BlueLine 27 pH 1M-DIN-ID
BlueLine 27 pH 1M-BNC-ID

L 39 1M-DIN-ID
L 39 1M-BNC-ID

A 157 1M-DIN-ID
A 157 1M-BNC-ID

N 6000 1M-DIN-ID
N 6000 1M-BNC-ID

Order No.	Type No.	Length L [mm]	Ø [mm]	pH-glass	Temp. range [°C]	Remarks
Spear tip pH combination electrodes						
285129930	BlueLine 21 pH 1M-DIN-ID	65/25	12/5	L	-5 … +80	Hole diaphragm, spear membrane, DIN plug
285129940	BlueLine 21 pH 1M-BNC-ID	65/25	12/5	L	-5 … +80	Hole diaphragm, spear membrane, BNC plug
285130100	L 6880 1M-DIN-ID	70/50	12/8	A	-5 … +100	3 x ceramic diaphragm, spear membrane, DIN plug
285130110	L 6880 1M-BNC-ID	70/50	12/8	A	-5 … +100	3 x ceramic diaphragm, spear membrane, BNC plug
285130120	N 1048 1M-DIN-ID[1)]	120	12	A	-5 … +100	Ceramic diaphragm, spear membrane, DIN- + 4 mm plug
285130130	N 1048 1M-BNC-ID[1)]	120	12	A	-5 … +100	Ceramic diaphragm, spear membrane, BNC- + 4 mm plug
Surface pH combination electrodes						
285129950	BlueLine 27 pH 1M-DIN-ID	120	12	L	-5 … +50	KPG® annular gap diaphragm, flat membrane, DIN plug
285129960	BlueLine 27 pH 1M-BNC-ID	120	12	L	-5 … +50	KPG® annular gap diaphragm, flat membrane, BNC plug
285130140	L 39 1M-DIN-ID	120	12	A	-5 … +50	Fibre diaphragm, flat membrane, DIN plug
285130150	L 39 1M-BNC-ID	120	12	A	-5 … +50	Fibre diaphragm, flat membrane, BNC plug
Micro pH combination electrodes						
285130160	A 157 1M-DIN-ID[1)]	40/130	12/5	A	-5 … +100	Platinum diaphragm, cylindrical membrane, DIN plug
285130170	A 157 1M-BNC-ID[1)]	40/130	12/5	A	-5 … +100	Platinum diaphragm, cylindrical membrane, BNC plug
285130180	N 6000 1M-DIN-ID	96[2)]	3	A	-5 … +100	Platinum diaphragm, cylindrical membrane, DIN plug
285130190	N 6000 1M-BNC-ID	96[2)]	3	A	-5 … +100	Platinum diaphragm, cylindrical membrane, BNC plug

[1)] with integrated temperature sensor Pt 1000
[2)] Length from upper end of standard taper (Standard taper NS 7.5)

ScienceLine pH combination electrodes

pH combination electrodes with plug head and fixed cable

Reference system:	silver/silver chloride (See Remarks)
Shaft material:	glass
Zero point:	pH = 7.0 ± 0.3
Electrolyte:	KCl 3 mol/l (except N 6250: KCl 4.2 mol/l A 7780 and L 7780: gel electrolyte L 8280: Referid® electrolyte)
Membrane shape:	sphere
pH range:	0 .. .14
Connection cable:	
for plug head:	e.g. L 1 A (See also page with connection cables)
fixed cable:	1 m long, with plug A acc. to DIN 19262 or with BNC plug

H 61
H 62
H 63
N 61
N 62
H 6180
H 6280
H 6380
N 6180
N 6250
N 6280
N 42 A
N 42 BNC
N 50 A
N 52 A
N 52 BNC
N 61 eis
H 61-500
H 61-600

H 64
N 64
N 6480 eis
N 6480 eth

N 65
H 65
H 6580
N 6580

L 32

L 7780
A 7780

N 6980

L 8280

Order No.	Type No.	Length L [mm]	Ø [mm]	Dia-phragm	pH-glass	Temp. range [°C]	Connection	Remarks
285101260	A 7780	120	12	3 x ceramic	A	-5 … +80	plug head	gel electrolyte
285100207	H 61	170	12	platinum	H	+10 … +100	plug head	
285092583	H 61-500	500	12	platinum	H	0...+100	plug head	Silamid® reference system
285092591	H 61-600	600	12	platinum	H	0...+100	plug head	Silamid® reference system
285102524	H 6180	170	12	ceramic	H	+10 … +100	plug head	
285100215	H 62	120	12	platinum	H	+10 … +100	plug head	
285102532	H 6280	120	12	ceramic	H	+10 … +100	plug head	
285100223	H 63	320	12	platinum	H	+10 … +100	plug head	
285102549	H 6380	320	12	ceramic	H	+10 … +100	plug head	
285100231	H 64	170	12	ground joint	H	+10 … +100	plug head	
285100248	H 65	103[1)]	10	platinum	H	+10 … +100	plug head	standard taper NS 14.5
285102565	H 6580	103[1)]	10	ceramic	H	+10 … +100	plug head	standard taper NS 14.5
1061093	L 32	120	12	fibre	A	-5 … +50	plug head	plastic shaft
285101252	L 7780	120	12	ceramic	L	-5 … +80	plug head	gel electrolyte
285101277	L 8280	120	12	KPG®	L	-5 … +80	plug head	Referid® electrolyte
285100437	N 42 A	120	12	ceramic	A	-5 … +100	DIN plug	
285101544	N 42 BNC	120	12	ceramic	A	-5 … +100	BNC plug	
285100453	N 50 A	108	12	ceramic	A	-5 … +100	DIN plug	for portable Knick pH meters
285100494	N 52 A	120	12	platinum	A	-5 … +100	DIN plug	
285105451	N 52 BNC	120	12	platinum	A	-5 … +100	BNC plug	
285100001	N 61	170	12	platinum	A	-5 … +100	plug head	
285100018	N 6180	170	12	ceramic	A	-5 … +100	plug head	
285100034	N 62	120	12	platinum	A	-5 … +100	plug head	
285100112	N 6250	120	12	ceramic	A	+15 … +40	plug head	calomel ref., for TRIS buffers
285100042	N 6280	120	12	ceramic	A	-5 … +100	plug head	
285100059	N 64	170	12	ground joint	A	-5 … +100	plug head	
285100067	N 65	103[1)]	10	platinum	A	-5 … +100	plug head	standard taper NS 14.5
285102516	N 6580	103[1)]	10	ceramic	A	-5 … +100	plug head	standard taper NS 14.5
285101709	N 6980	103[1)]	10	ground joint	A	-5 … +100	plug head	standard taper NS 14.5
285092661	N 61eis	170	12	3 x platinum	A	+10 … +40	plug head	electrolyte L 5014
285092337	N 6480 eis	170	12	ground joint	A	+10 … +40	plug head	electrolyte L 5014
285092329	N 6480 eth	170	12	ground joint	A	0 … +40	plug head	electrolyte L 5014

[1)] Length from upper end of standard taper

ScienceLine pH combination electrodes with temperature sensor

pH combination electrodes with temperature sensor

Reference system:	silver/silver chloride
Shaft material:	glass
Diameter:	12 mm
Zero point:	pH = 7.0 ± 0.3
Electrolyte:	KCl 3 mol/l
Temperature sensor:	Pt 1000
Membrane shape:	sphere
pH range:	0 … 14
Connection cable:	
for SMEK-plug head:	e.g. LS 1 ANN (See also page with connection cables)
fixed cable:	1 m long, with plug A acc. to DIN 19262 or with BNC plug, as well as plug for temperature sensor

N 1042 A
N 1041 A
N 1041BNC
N 1042 BNC
N 1050 A
N 1051 A
N 1051 BNC
N 1052 A
N 1052 BNC
N 2041 A
N 2042 A
N 1041 A - 600
N 1043 A

A 162
A 161
H 161
H 162

A 164

Order No.	Type No.	Length L [mm]	Dia-phragm	pH-glass	Temp.-range [°C]	Connection	Remarks
285129517	A 161	170	platinum	A	-5 … +100	SMEK plug head	
285129525	A 162	120	platinum	A	-5 … +100	SMEK plug head	
285129600	A 164	170	ground joint	A	-5 … +100	SMEK plug head	
285129590	H 161	170	platinum	H	+10 … +100	SMEK plug head	
285129580	H 162	120	platinum	H	+10 … +100	SMEK plug head	
285100486	N 1041 A	170	ceramic	A	-5 … +100	DIN- + 4-mm plug	
285093111	N 1041 A -600	600	ceramic	A	-5...+100	DIN- + 4-mm plug	
285100531	N 1041 BNC	170	ceramic	A	-5 … +100	BNC- + 4-mm plug	
285104541	N 1042 A	120	ceramic	A	-5 … +100	DIN- + 4-mm plug	
285105476	N 1042 BNC	120	ceramic	A	-5 … +100	BNC- + 4-mm plug	
285093009	N 1043 A	320	ceramic	A	-5...+100	DIN- + 4-mm plug	
285100375	N 1050 A	108	ceramic	A	-5 … +100	DIN- + 4-mm plug	for portable Knick pH Meter
285100510	N 1051 A	170	platinum	A	-5 … +100	DIN- + 4-mm plug	
285100500	N 1051 BNC	170	platinum	A	-5 … +100	BNC- + 4-mm plug	
1054512	N 1052 A	120	platinum	A	-5 … +100	DIN- + 4-mm plug	
285100380	N 1052 BNC	120	platinum	A	-5 … +100	BNC- + 4-mm plug	
285100342	N 2041 A	170	ceramic	A	-5 … +100	DIN- + 2-mm plug	
285100359	N 2042 A	120	ceramic	A	-5 … +100	DIN- + 2-mm plug	

ScienceLine micro, spear tip and surface pH combination electrodes

Micro, spear tip and surface pH combination electrodes

Reference system:	silver/silver chloride
Shaft material:	glass (except L 39: plastic shaft)
Zero point:	pH = 7.0 ± 0.3
Electrolyte:	KCl 3 mol/l (except L8880: Referid®)
Type of membrane glass:	A
Connection cable:	
for SMEK plug head:	e.g. LS 1 ANN (See also page with connection cables)
for plug head versions:	e.g. L 1 A (See also page with connection cables)
fixed cable:	1 m long, with plug A acc. to DIN 19262 or with BNC plug, as well as plug for temperature sensor

A 157 | **L 6880** *L 8880* | **L 39** | **N 1048 A** *N 48 A* *N 48 BNC* | **N 5800 A** *N 5800 BNC* *N 5900 A* | **N 6000 A** *N 6000 BNC* | **N 6003**

Order No.	Type No.	Length L [mm]	Ø [mm]	Dia-phragm	Membrane shape	Temp.-range [°C]	Range [pH]	Connection
Micro								
285129610	A 157[1)]	40/130	12/5	platinum	cylindrical	-5 … +100	0 … 14	SMEK plug head
285105127	N 5800 A	96[2)]	5	3 x platinum	spear	-5 … +100	0 … 14	DIN plug
285105579	N 5800 BNC	96[2)]	5	3 x platinum	spear	-5 … +100	0 … 14	BNC plug
285105135	N 5900 A	96[2)]	5	platinum	sphere	-5 … +100	0 … 14	DIN plug
285105151	N 6000 A	96[2)]	3	platinum	cylindrical	-5 … +100	0 … 14	DIN plug
285105632	N 6000 BNC	96[2)]	3	platinum	cylindrical	-5 … +100	0 … 14	BNC plug
285105176	N 6003	180	3	ceramic	cylindrical	-5 … +100	0 … 14	plug head
Spear tip								
285104611	N 1048 A[1)]	120	12	ceramic	spear	-5 … +100	0 … 14	DIN- + 4-mm plug
285100445	N 48 A	120	12	ceramic	spear	-5 … +100	0 … 14	DIN plug
285101569	N 48 BNC	120	12	ceramic	spear	-5 … +100	0 … 14	BNC plug
285101211	L 6880	70/50	12/8	3 x ceramic	spear	-5 … +100	0 … 14	plug head
285101285	L 8880	70/50	12/8	hole	spear	-5 … +80	2 … 13	plug head
Surface								
1061094	L 39	120	12	fibre	flat	-5 … +50	1 … 13	plug head

[1)] with integrated temperature sensor Pt 1000

[2)] Length from upper end of standard taper (Standard taper NS 7.5)

ScienceLine metal combination electrodes

Metal combination electrodes with plug head and connection cable

Temperature range:	-5 … +100 °C (except Pt 6140: +10 … +40 °C)
Reference system:	silver/silver chloride (except Pt 6140: Calomel reference system)
Shaft material:	glass
Electrolyte:	KCl 3 mol/l (See also remarks)
Connection cable:	
for plug head:	e.g. L 1 A (See also page with connection cables)
fixed cable:	1 m long, with plug A acc. to DIN 19262 or with BNC plug

AgCl 62
AgCl 65
Ag 42 A
Ag 6180
Ag 6280
Ag 6580
AgCl 6280
Au 6280

Pt 61
Pt 62
Pt 6180
Pt 6280
Pt 6580
Pt 42 A

Pt 6880
Pt 6980
Pt 48 A

Pt 6140

Pt 8280

Pt 5900 A
Pt 5900 BNC
Pt 5901

Order No.	Type No.	Length L [mm]	Dia-phragm	Ø [mm]	Sensor Metal, shape	Connection	Remarks
285102051	Ag 42 A	120	ceramic	12	Ag, cap, 4 mm Ø	DIN plug	electrolyte L 2114
285102208	Ag 6180	170	ceramic	12	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
285102343	Ag 6280	120	ceramic	12	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
285102216	Ag 6580	103[1)]	ceramic	10	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
285102351	AgCl 6280[3)]	120	ceramic	12	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
285102413	AgCl 62[3)]	120	platinum	12	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
1061051	AgCl 65[3)]	103[1)]	platinum	12	Ag, cap, 4 mm Ø	plug head	electrolyte L 2114
285102121	Au 6280	120	ceramic	12	Au, pole, 2 mm Ø	plug head	
285102302	Pt 42 A	120	ceramic	12	Pt, pole, 1 mm Ø	DIN plug	
285102224	Pt 48 A	120	ceramic	12	Pt, ring, 6 mm Ø	DIN plug	
285105192	Pt 5900 A	96[2)]	platinum	5	Pt, pole, 1 mm Ø	DIN plug	
285105702	Pt 5900 BNC	96[2)]	platinum	5	Pt, pole, 1 mm Ø	BNC plug	
285105065	Pt 5901	160[2)]	platinum	5	Pt, pole, 1 mm Ø	plug head	
285102002	Pt 61	170	platinum	12	Pt, pole, 1 mm Ø	plug head	
285102019	Pt 62	120	platinum	12	Pt, pole, 1 mm Ø	plug head	
285097162	Pt 6140	150/20	platinum	12/5	Pt, pole, 1 mm Ø	plug head	for spear tip, electrolyte L420
285102232	Pt 6180	170	ceramic	12	Pt, pole, 1 mm Ø	plug head	
285102249	Pt 6280	120	ceramic	12	Pt, pole, 1 mm Ø	plug head	
285102257	Pt 6580	103[1)]	ceramic	10	Pt, pole, 1 mm Ø	plug head	
285100075	Pt 6880	120	ceramic	12	Pt, ring, 6 mm Ø	plug head	
285102265	Pt 6980	170	ceramic	12	Pt, ring, 6 mm Ø	plug head	
285102281	Pt 8280	120	KPG®	12	Pt, round, 6 mm Ø	plug head	electrolyte Referid®

[1)] Length from upper end of standard taper; standard taper NS 14.5

[2)] Length from upper end of standard taper; standard taper NS 7.5

[3)] Sensor coated with AgCl

ScienceLine single electrodes:
pH glass electrodes and metal electrodes

ScienceLine single electrodes

pH glass electrodes

Reference system: silver/silver chloride
Shaft material: glass, 12 mm Ø
Zero point: pH = 7.0 ± 0.3
Membrane shape: sphere
Connection cable: e.g. L 1 A

Metal electrodes

Shaft material: glass, 12 mm Ø
(See remarks)

A 1180
H 1180

Ag 1100

KF 1100

Pt 1400
Pt 1200

Pt 1800

Order No.	Type No.	Length L [mm]	pH Glass	Range [pH]	Temp.-range [°C]	Remarks
1057997	A 1180[1)]	120	H	0 … 14	0 … +80	plug head
285103212	H 1180	120	H	0 … 14	10 … +100	plug head

Order No.	Type No.	Length L [mm]	Sensor Metal	Sensor shape	Temp. range [°C]	Remarks
285103607	Ag 1100	120	Ag	cap, 4 mm Ø	-5 … +100	plug head, cable e.g. L 1 A
285102030	KF 1100	96[1)]	Pt[2)]	2 pole, 1 mm Ø	-30 … +135	shaft 5 mm Ø, standard taper NS 7.5, fixed cable, 2x 4-mm plug
285103512	Pt 1200	120	Pt[2)]	2 pole, 1 mm Ø	-30 … +135	plug head, cable e.g. L 1 NN
285103537	Pt 1400	103[1)]	Pt[2)]	2 pole, 1 mm Ø	-30 … +135	shaft 10 mm Ø, standard taper NS 14.5, cable e.g. L 1 NN
285103553	Pt 1800	120	Pt	ring, 6 mm Ø	-30 … +135	plug head, cable e.g. L 1 A

[1)] Length from upper end of standard taper

[2)] Double platinum electrode

ScienceLine single electrodes:
Reference electrodes

Reference electrodes

Shaft material: glass
Electrolyte depending on reference system:

Ag/AgCl:	KCl 3 mol/l, e.g. L 300
Calomel:	KCl 4.2 mol/l, e.g. L 420
Hg/Hg_2SO_4:	K_2SO_4 0.6 mol/l, e.g. L 1254

pH range: 0 … 14
Connection cable: e.g. L 1 N (or B 1 N for B 1180-L190-D4)

B 2220+ | **B 2420+** | **B 2920+** *B 2810+ B 2820+ B 2910+* | **B 3520+** *B 3410+ B 3420+ B 3510+ B 3610+* | **B 3920+** | **B 1180-L190-D4**

Order No.	Type No.	Length L [mm]	Ø [mm]	Temp. range [°C]	Dia-phragm	Reference system	Remarks
285095280	B 1180-L190-D4	190	4	-5...+50	ceramic	Ag/AgCl	Low maintenance, paste electrolyte, plug head for reference electrodes
1069994	B 2220+	120	12	-5 … +100	ceramic	Ag/AgCl	double electrolyte system
1070028	B 2420+	120	12	-5 … +100	ground joint	Ag/AgCl	
1070029	B 2810+	120	12	+15 … +40	ceramic	Calomel	
1070044	B 2820+	120	12	-5 … +100	ceramic	Ag/AgCl	
1070077	B 2910+	120	12	+15 … +40	platinum	Calomel	
1070046	B 2920+	120	12	-5 … +100	platinum	Ag/AgCl	
1070048	B 3410+	103[1)]	10	+15 … +40	ceramic	Calomel	standard taper NS 14.5
1070070	B 3420+	103[1)]	10	-5 … +100	ceramic	Ag/AgCl	standard taper NS 14.5
1070100	B 3510+	103[1)]	10	+15 … +40	platinum	Calomel	standard taper NS 14.5
1070073	B 3520+	103[1)]	10	-5 … +100	platinum	Ag/AgCl	standard taper NS 14.5
1070074	B 3610+	103[1)]	10	+15 … +40	ceramic	Hg/Hg_2SO_4	standard taper NS 14.5
1070075	B 3920+	103[1)]	10	-5 … +100	ground joint	Ag/AgCl	double electrolyte system, standard taper NS 14.5

[1)] Length from upper end of standard taper

ScienceLine conductivity measuring cells

Conductivity measuring cells with 1 m fixed cable with 8-pole plug

Shaft: 12 mm Ø (except LF 413 T-3 and LF 413 T: 15.3 mm)

Temperature sensor: NTC 30 KΩ

LF 313 T

LF 413 T-3
LF 413 T

LF 513 T
LF 613 T
LF 813 T

LF 713 T
LF 713 T-250

LF 913 T

LFOX 1400

Order No.	Type No.	Length L [mm]	Sensor	Cell const. approx. [cm^{-1}]	Temp. range [°C]	Meas. range[1)] [µS/cm]. . .[mS/cm]	Remarks
285414360	LF 313 T	120	Stainless steel	0.1	0 ... +100	0 … 0.2	Ultrapure water conductivity cell with flow-through vessel, stainless steel shaft, fixed cable 1.5 m.
285414351	LF 313 T NFTC	120	Stainless steel	0.1	0 ... +100	0 … 0.2	Ultrapure water conductivity cell **without** flow-through vessel, stainless steel shaft, fixed cable 1.5 m.
285106148	LF 413 T-3	120	4 x Graphite	0.475	-5 … +80	0 … 2000	plastic shaft, fixed cable 3 m.
285106172	LF 413 T	120	4 x Graphite	0.475	-5 … +80	0 … 2000	plastic shaft
285106037	LF 513 T	120	2 Pt rings	1.0	-5 … +80	0 … 200	plastic shaft
285106131	LF 613 T	120	4 Pt rings	1.0	-5 … +80	0 … 2000	plastic shaft
285106189	LF 713 T	120	4 Pt rings	1.0	-30 … +135	0 … 2000	glass shaft
285106190	LF 713 T-250	250	4 Pt rings	1.0	-30 … +135	0 … 2000	glass shaft
285106250	LF 813 T	120	5 Pt rings	0.650	-5 ... +80	0 … 2000	plastic shaft
285106260	LF 913 T	120	5 Pt rings	0.650	-30 ... +135	0 … 2000	glass shaft
285104630	LFOX 1400	145	Graphite	0.475	0 ... +50	0 … 2000	Combined 4-pole conductivity cell and galvanic D.O. sensor LFOX 1400 ID, plastic shaft, fixed cable 3 m.

[1)] Outside the recommended ranges measuring errors >10% can occur with these conductivity measuring cells.

ScienceLine sensors for ammonia, sodium, oxygen, ion-selective indicator electrodes

Ammonia combination electrode with plug head

Shaft material: plastic, 12 mm Ø
Connection cable: e.g. L 1 A

Sodium combination electrode with plug head

Reference system: Silamid®
Shaft material: glass, 12 mm Ø
Zero point: pNa = 2.0
Membrane shape: sphere
Connection cable: e.g. L 1 A

Oxygen electrodes

Shaft material: plastic (POM)

ISE measuring cells

Shaft material: plastic
Length: 120 mm
Fixed cable: 1 m long, with DIN plug

ISE combination electrodes with plug head

Shaft material: plastic
Length: 120 mm

NH 1100 Na 61 **OX 1100+** **9009/61** **Cu 1100 A** *Ca 1100 A* *F 1100 A* *Pb 1100 A* **F 60** *Cl 60* *NO 60* *K 60* *CA 60* *CN 60* *AG-S 60* *I 60* *BR 60* *CU 60* *PB 60*

Order No.	Type No.	Length L [mm]	Temp. range [°C]	Meas. range [mg/l]	Remarks
285102808	NH 1100	120	0 … +50	0.1 … 1,000	membrane module replaceable

Order No.	Type No.	Length L [mm]	Diaphragm	Membrane Glass	Temp. range [°C]	Meas. range [pNa]	Remarks
285100026	Na 61	170	platinum	Na	-10 … +80	0 … 6	electrolyte KCl 3 mol/l, aqueous solution NaCl 0.1 mol/l

Order No.	Type No.	Length L [mm]	Temp. range [°C]	Meas. range [mg/l]	Remarks
1069975	OX 1100+	120	0 … +45	0 … 60	galvanic sensor, Pt cathode, Ag anode, SMEK plug head, temperature compensated (NTC 100kΩ), shaft 12 mm Ø, measuring current at saturation approx. 100 nA, minimum flow rate 10 cm/s, connection cable e.g. LS 1 ST4 OX (for CG 867)
285111664	9009/61	145	0 … +50	0 … 50	amperometric sensor, Au cathode, Pb anode, fixed cable 1.5 m[1)] with 8-pole plug, IMT temperature compensation, shaft 15.25 mm Ø, membrane FEP, 13 µm thick, accuracy 1% at 18 cm/s flow rate.

Order No.	Type No.	Parameter	Temp. range [°C]	pH-range	Measuring range [mg/l]
285216314	Ca 1100 A	Calcium	0 … +40	2.5 … 11	0.02 … 40,000
285216312	Cu 1100 A	Copper	0 … +80	2 … 6	0.0006 … 6,400
285216313	F 1100 A	Fluoride	0 … +80	5 … 7	0.02 … saturated
285216315	Pb 1100 A	Lead	0 … +80	4 … 7	0.1 … 20,000

Order No.	Type No.	Parameter	Temp. range [°C]	pH-range	Measuring range [mg/l]
285130340	F 60	Fluoride	0 … +80	5 … 7	0.02 … saturated
285130350	Cl 60	Chloride	0 … +80	2 … 12	2 … 35,000
285130360	NO 60	Nitrate	0 … +40	2.5 … 11	0.4 … 62,000
285130370	K 60	Potassium	0 … +40	2 … 12	0.04 … 39,000
285130380	CA 60	Calcium	0 … +40	2.5 … 11	0.02 … 40.000
285130390	CN 60	Cyanide	0 … +80	0 … 14	0.2 … 260
285130400	AG-S 60	Sulfide	0 … +80	2 … 12	0.003 … 32,000
285130410	I 60	Iodide	0 … +80	0 … 14	0.006 … 127,000
285130420	BR 60	Bromide	0 … +80	1 … 12	0.4 … 79,000
285130430	CU 60	Copper	0 … +80	2 … 6	0.0006 … 6400
285130440	PB 60	Lead	0 … +80	4 … 7	0.2 … 20,000

[1)] Other cable lengths available on request

Resistance thermometers

Resistance thermometers with SMEK plug head

Resistance thermometers with 1 m fixed cable

Resistance thermometer with coaxial plug head

W 2130+
W 2030+

W 5780 NN

W 5791 NN
W 5790 NN
W 5790 PP

W 5980 NN

W 2180-KOAX

Resistance thermometers with SMEK plug head

Order No.	Type No.	Length L [mm]	Ø [mm]	Sensor	Temp. range [°C]	Shaft material	Connection cable e.g.
1069991	W 2030+	120	12	Pt 100	-30 … +135	glass	LS 1 N6
1069992	W 2130+	120	12	Pt 1000	-30 … +135	glass	LS 1 N6

Resistance thermometers with 1 m fixed cable

Order No.	Type No.	Lenght L [mm]	Ø [mm]	Sensor	Temp. range [°C]	Shaft material	Connection plug
285105221	W 5780 NN	120	6	Pt 1000	-30 … +135	glass	2 x 4 mm Ø
285105254	W 5790 NN	120	4	Pt 1000	-30 … +135	stainless steel	2 x 4 mm Ø
285105776	W 5790 PP	120	4	Pt 1000	-30 … +135	stainless steel	2 x 2 mm Ø
285105262	W 5791 NN	170	4	Pt 1000	-30 … +135	stainless steel	2 x 4 mm Ø
285105287	W 5980 NN	96[1)]	5 NS 7.5	Pt 1000	-30 … +135	glass	2 x 4 mm Ø

Resistance thermometer with coaxial plug head

Order No.	Type No.	Length L [mm]	Ø [mm]	Sensor	Temp. range [°C]	Shaft material
285119030	W 2180-KOAX	120	12	Pt 1000	-30 … +135	glass

[1)] length from upper end of standard taper

Attractive shape, reliable function: BlueLine in use

The compact BlueLine program covers the most important measuring application in laboratories. Reliable, high speed settings over a wide temperature range, new membrane glass with higher mechanical stability as well as improved gel electrolyte are only a few features ensuring improved functionality. On electrodes with liquid electrolytes the refill opening is sealed tightly with a practical sliding plug.

Further recommendations for using BlueLine electrodes are given on the following pages. If you have any other special questions regarding BlueLine or the use of our electrodes: Simply call us.

BlueLine	**pH**						**Redox**		**Conductivity**
plug head (for cable: e.g. LB1A, LB1BNC)	**11 pH[1)]**	**22 pH[2)]**	**13 pH**	**16 pH**	**21 pH**	**27 pH**	**31 Rx**	**32 Rx**	
fixed cable, 8-pole plug									**48 LF**
Application	high perf.	robust	precision	micro	spear tip	surface	standard	robust	low conduct.
acid, diluted	■		□						
agar-agar gel					□	■			
aquarium water	■	■	□				□	■	
aqueous media in general	■	□	□				□	□	
bacteria cultures				■	□	■			
beer	■		□				□	□	
boiler feed water	■		■						■
bread					■				
butter/margarin					■				
cheese					■	□			
coffee extract	■		□						
condensate	■		■						■
cooling water	■	□	□				□		
cream	■		■						
cyanide detoxification	■		□				■		
desalination/ion exchange	■		■						■
detergent	□		■						
disinfectant	■		□				■	□	
dispersion paint	□		■					□	
drinking water	■		□				□	□	
effluents in general	■	■	□				□	■	
electroplating bath	■		□				■		
electroplating wastewater	□	■	□				■	■	
emulsions, water-based	■		■				■	□	□
environmental analysis	■		□				■	□	□
extreme pH values	□		■						
fertilizer solution	■		□				■	□	
field measurements	□	■						■	
fish					■				
fixing baths	■		□				□		
grease	□		■						
ground water	■		■				□	■	
infusion solutions	■	□	□						
jam	■		□						
juice	■	□	□				□		

These electrodes provide examples for electrodes with [1)] liquid electrolyte and with [2)] gel electrolyte. The corresponding versions with fixed cable and/or integrated temperature sensor are given in the technical descriptions below.

BlueLine	pH						Redox		Conductivity
plug head (for cable: e.g. LB1A, LB1BNC)	11 pH[1)]	22 pH[2)]	13 pH	16 pH	21 pH	27 pH	31 Rx	32 Rx	
fixed cable, 8-pole plug									48 LF
Application	high perf.	robust	precision	micro	spear tip	surface	standard	robust	low conduct.
kjeldahl distillation	■		▪						
lemonade	■		▪				▪		
liquids containing protein	■		■						
low-ionic strength samples	■		■						■
lye, diluted[3)]	▪		■						
measurement narrow vessels				■					
mediums containing sulfide	▪		■						
milk	■		▪						
mineral water	■	▪	▪						
oil/water emulsion			■						
organic percentile high	▪		■						
paper						■			
paper extract	■		▪						
photographic developer	■	▪					▪		
precision measurement	■		■						▪
rain water	■		■						■
redox reaction/titration							■		▪
salt solution/brine	■		▪						
sausage/meat					■	▪			
seawater	■		■						
serum	■		▪	■					
skin/leather						■			
soap	■		▪						
soil extract	■	▪	▪				▪		▪
suspension, water-based	▪		■						
titration in aqueous media	■		▪				▪		
toothpaste	▪				■	▪			
TRIS buffer solution	■		▪						
ultra-pure water	■		■						▪
varnish (water-based)	▪		■				■		
vegetable/fruits					■	▪			
wine	■		▪						
yogurt	■		▪						

■ Recommended by SCHOTT Instruments
▪ Can be used for application
[3)] See also ScienceLine electrodes with H-glass.
For some applications, other application recommendations are practical. Please also observe the material resistance of the sensor to the measuring medium.
Other sensors are available in our ScienceLine product range. If you cannot find your application, please ask us – by telephone, fax or E-mail.

BlueLine pH combination electrodes

The robust electrodes for general applications

pH range	0...14
Temperature range	-5...+80 °C
Shaft	Noryl, 12 mm Ø
Shaft length L	120 mm
Zero point	pH = 7.0 ± 0.3
Diaphragm	fibre
Reference system	Silamid®
Reference electrolyte	gel (KCl), low maintenance, not refillable
Shape of glass membrane	cylindrical
Resistance of glass membrane (25 °C)	400 MΩ
Type of membrane glass	A

The liquid electrolyte electrodes for demanding measurements

pH range	0...14
Temperature range	-5...+100 °C
Shaft	glass, 12 mm Ø
Shaft length L L	120 mm
Zero point	pH = 7.0 ± 0.3
Diaphragm	platinum
Reference system	Silamid®
Reference electrolyte	KCl 3 mol/l
Shape of glass membrane	conical
Resistance of glass membrane (25 °C)	300 MΩ
Type of membrane glass	A

BlueLine 28 pH
22 pH
23 pH
24 pH
24-3 pH
25 pH
26 pH
26 pH-Cinch
28 pH-P
28-5 pH
29 pH
29 pH-P

BlueLine 18 pH
11 pH
12 pH
14 pH
15 pH
17 pH
19 pH

Order No.	BlueLine Type No.	Temperature sensor integrated	Connection
285129225	22 pH	no	plug head, recommended cable: e.g. LB1A
285129233	23 pH	no	1 m fixed cable with DIN plug 19 262
285129241	24 pH	NTC 30 kΩ	1 m fixed cable with DIN plug 19 262 + banana plug
285129533	24-3 pH	NTC 30 kΩ	3 m fixed cable with DIN plug 19 262 + banana plug
285129258	25 pH	no	1 m fixed cable with BNC plug
285129266	26 pH	NTC 30 kΩ	1 m fixed cable with BNC plug + banana plug
285095712	26 pH-Cinch	NTC 30 kΩ	1 m fixed cable with BNC plug + cinch plug
285129282	28 pH	Pt 1000	1 m fixed cable with DIN plug 19 262 + banana plug
1065896	28 pH-P	Pt 1000	1 m fixed cable with DIN plug 19 262 + 2-mm pole plug
285129570	28-5 pH	Pt 1000	5 m fixed cable with DIN plug 19 262 + banana plug
1065895	29 pH	Pt 1000	1 m fixed cable with BNC plug + banana plug
1065894	29 pH-P	Pt 1000	1 m fixed cable with BNC plug + 2-mm pole plug

Order No.	BlueLine Type No.	Temperature sensor integrated	Connection
285129114	11 pH	no	plug head, recommended cable: e.g. LB1A
285129122	12 pH	no	1 m fixed cable with DIN plug 19 262
285129147	14 pH	NTC 30 kΩ	1 m fixed cable with DIN plug 19 262 + banana plug
285129155	15 pH	NTC 30 kΩ	1 m fixed cable with BNC plug + banana plug
285129171	17 pH	no	1 m fixed cable with BNC plug
285129188	18 pH	Pt 1000	1 m fixed cable with DIN plug 19 262 + banana plug
285129190	19 pH	Pt 1000	1 m fixed cable with BNC plug + banana plug

BlueLine
Special sensors

The specialists
for special applications

Zero point of
pH electrodes pH = 7.0 ± 0.3

Connection cable
for pH/Redox
electrodes e.g. LB 1 A

BlueLine 13 pH | BlueLine 16 pH | BlueLine 21 pH | BlueLine 27 pH | BlueLine 31 Rx | BlueLine 32 Rx | BlueLine 48 LF

Precision electrode BlueLine 13 pH

Glass shaft, screw ground joint diaphragm, electrolyte KCl 3 mol/l, Silamid® reference system, spherical membrane, A-glass, plug head, length 170 mm, 12 mm Ø, -5 … +100 °C, 0 … 14pH, Order No. 285129139

Micro electrode BlueLine 16 pH

Glass shaft, platinum diaphragm, electrolyte KCl 3 mol/l, Silamid® reference system, spherical membrane, L-glass, plug head, length 40/80 mm, 12/5 mm Ø, -5 … +100 °C, 0 … 14pH, Order No. 285129163

Spear tip electrode BlueLine 21 pH

Glass shaft, hole diaphragm, Referid® electrolyte, Silamid® reference system, Spear membrane, L-glass, plug head, length 65/25 mm, 12/5 mm Ø, -5 … +80 °C, 2 … 13pH, Order No. 285129217

Surface electrode BlueLine 27 pH

Glass shaft, KPG® annular gap diaphragm, Referid® electrolyte, Silamid® reference system, flat membrane, L-glass, plug head, length 120 mm, 12 mm Ø, -5 … +50 °C, 2 … 13pH, Order No. 285129274

Redox electrode BlueLine 31 Rx

Glass shaft, ceramic diaphragm, electrolyte KCl 3 mol/l, Silamid® reference system, sensor platinum disk 4 mm Ø, plug head, length 120 mm, 12 mm Ø, -5 … +100 °C, Order No. 285129311

Redox electrode BlueLine 32 Rx

Plastic shaft, fibre diaphragm, gel electrolyte, Silamid® reference system, sensor platinum pin 1 mm Ø, plug head, length 120 mm, 12 mm Ø, -5 … +80 °C, Order No. 285129320

Conductivity cell for low ionic media BlueLine 48 LF

Stainless steel shaft, 2-pin cell, 1 m fixed cable with 8-pole plug, sensor stainless steel, cell constant 0.1 cm^{-1}, temperature sensor NTC 30 kΩ, length 120 mm, 12 mm Ø, -5 … +80 °C, measuring range 0 … 300 µS/cm, Order No. 285129488

Connection cables

1 Electrode socket/plug

Connection cable for pH , redox, ammonia and sodium combination electrodes, pH and redox single electrodes as well as reference electrodes in *Plus* series

socket L

(Socket L and socket LB are compatibel among themselves)

SMEK for pH combination electrodes with temperature sensor as well as conductivity measuring cells, resistance thermometers and oxygen sensors from *Plus* series

socket LS

Electrode plug for reference electrodes from the predecessor series, i.e. "non-*Plus*" versions

plug B

Plug for resistance thermometers in conductivity measuring cells without temperature sensor, for older models

plug 9907/00

Plug for conductivity measuring cells with temperature sensor and oxygen cells, for older models

plug 9909/00

2 Instrument connector/plug

A (DIN, Germany)

BNC (Europe, overseas)

EE (Radiometer)

R (Metrohm)

S (UK socket without extension)

N (4-mm banana plug)

P (2-mm pole plug)

8-pole (for Handylab and CG 853(P))

9910/00

Not illustrated:
D (USA, single electrodes)
H (Seibold, Lemo plug)
X (without instrument plug, free cable end)

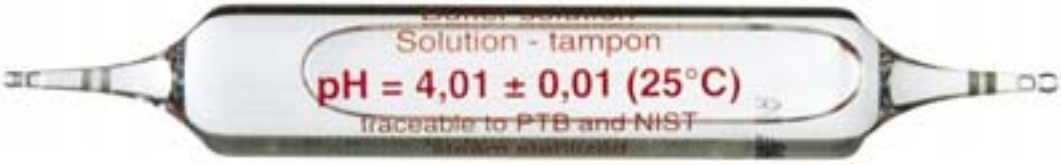
Order No.	Type No.	1 Electrode socket/plug	2 Instrument connector/plug	Cable length and type
285122904	A 1 A	DIN instrument plug (A)	DIN instrument plug (A)	1 m coax. cable
285123793	A 1 BNC	DIN instrument plug (A)	BNC instrument plug	1 m coax. cable
285121916	B 1 N	reference electrode plug (B)	4 mm banana plug (N)	1 m single conductor cable
285122012	B 1 P	reference electrode plug (B)	2 mm Pole plug (P)	1 m single conductor cable
285121813	B 1X	reference electrode plug (B)	free end (X)	1 m single conductor cable
285122456	L 1 A	electrode plug (L)	DIN instrument plug (A)	1 m coax. cable
285122497	L 1 BNC	electrode plug (L)	BNC instrument plug	1 m coax. cable
285122604	L 1 DP	electrode plug (L)	(D) + 2 mm Pole plug (P)	1 m coax. cable
285122501	L 1 EE	electrode plug (L)	Radiometer instrument plug (EE)	1 m coax. cable
285122457	L 1 N	electrode plug (L)	4 mm banana plug (N)	1 m coax. cable
285122489	L 1 NN	electrode plug (L)	2 x 4 mm banana plug (NN)	1 m coax. cable
285122534	L 1 R	electrode plug (L)	Metrohm instrument plug (R)	1 m coax. cable
285122407	L 1 X	electrode plug (L)	free end (X)	1 m coax. cable
285122464	L 2 A	electrode plug (L)	DIN instrument plug (A)	2 m coax. cable
285122448	L 2 NN	electrode plug (L)	2 x 4 mm banana plug (NN)	2 m coax. cable
285122653	LB 1 A	electrode plug (LB)	DIN instrument plug (A)	1 m coax. cable
285122661	LB 1 BNC	electrode plug (LB)	BNC instrument plug	1 m coax. cable
285122678	LB 3 A	electrode plug (LB)	DIN instrument plug (A)	3 m coax. cable
285122707	LS 1 ANN	SMEK electrode plug	DIN (A) + 2 x 4 mm banana plug	1 m cable KA19
285122715	LS 3 ANN	SMEK electrode plug	DIN (A) + 2 x 4 mm banana plug	3 m cable KA19
285122723	LS 1 BNCNN	SMEK electrode plug	BNC + 2 x 4 mm banana plug	1 m cable KA19
285122731	LS 3 BNCNN	SMEK electrode plug	BNC + 2 x 4 mm banana plug	3 m cable KA19
1066726	LS 1 D8	SMEK electrode plug	8-pole instrument plug	1 m cable
1066728	LS 1 N6	SMEK electrode plug	6 x 4 mm banana plug	1 m cable KA09
285122756	LS 1 RNN	SMEK electrode plug	Metrohm (R) + 2 x 4 mm banana plug	1 m cable KA19
1069104	LS 1 ST4LF	SMEK electrode plug	4-pole incremental plug	1 m cable
1066727	LS 1 ST4OX	SMEK electrode plug	4-pole incremental plug	1 m cable KA10
285124716	9907/21	electrode plug (9907/00)	2 x 4-mm plug for LF cells (NN)	1 m two-conductor cable
285125618	9909/31	electrode plug (9907/00)	2 x 4-mm plug (NN)	1 m two-conductor cable
285125515	9910/11	electrode plug (9909/00)	9910	1 m four-conductor cable
285125215	9910/21	electrode plug (9909/00)	9910	1 m four-conductor cable, shielded
285125523	9919/21	electrode plug (9907/00)	8-pole instrument plug	1 m two-conductor cable
285125548	9919/41	electrode plug (9909/00	8-pole instrument plug	1 m four-conductor cable

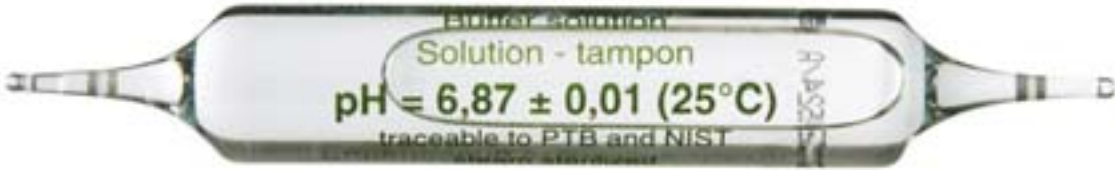
Other plug/cable combinations available on request

Solutions

Standard buffer solutions according to DIN 19 266
Hot steam sterilized for longer stability, no preservation agents used.

Order No.	Type No.	pH value at 25 °C	Contents
285137977	L 4791	1.68	60 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138246	L 4794	4.01	60 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138254	L 4796	6.87	60 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138262	L 4799	9.18	60 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138402	L 4790	4.01/6.87	2 x 30 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285137985	L 4797	1.68/6.87/9.18	3 x 20 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138238	L 4798	4.01/6.87/9.18	3 x 20 FIOLAX® ampoules à 20 ml, with manufacturer's certificate
285138279	L 4893/Set	4.01/6.87	2 x 9 FIOLAX® ampoules à 20 ml, with manufacturer's certificate, with electrolyte solution L 3008
285137841	L 168	1.68	1000 ml in DURAN® glass bottle, with manufacturer's certificate
285137677	L 1684	1.68	250 ml in DURAN® glass bottle, with manufacturer's certificate
285138098	L 401	4.01	1000 ml in DURAN® glass bottle, with manufacturer's certificate
285138008	L 4014	4.01	250 ml in DURAN® glass bottle, with manufacturer's certificate
285138102	L 687	6.87	1000 ml in DURAN® glass bottle, with manufacturer's certificate
285138016	L 6874	6.87	250 ml in DURAN® glass bottle, with manufacturer's certificate
285138119	L 918	9.18	1000 ml in DURAN® glass bottle, with manufacturer's certificate
285138024	L 9184	9.18	250 ml in DURAN® glass bottle, with manufacturer's certificate





Technical buffer solutions

Hot steam sterilized for longer stability, no preservation agents used.

Order No.	Type No.	pH value at 25 °C	Contents
285138213	L 4694	4.00	60 FIOLAX® ampoules à 20 ml
285138221	L 4697	7.00	60 FIOLAX® ampoules à 20 ml
285138205	L 4691	10.01	60 FIOLAX® ampoules à 20 ml
285138398	L 4690	4.00/7.00	2 x 30 FIOLAX® ampoules à 20 ml
285138192	L 4698	4.00/7.00/10.01	3 x 20 FIOLAX® ampoules à 20 ml
285138632	L 4895/Set	4.00/7.00	2 x 9 FIOLAX® ampoules à 20 ml with electrolyte solution L 3008
285138727	L 400	4.00	1000 ml in DURAN® glass bottle
285138032	L 4004	4.00	250 ml in DURAN® glass bottle
285138735	L 700	7.00	1000 ml in DURAN® glass bottle
285138049	L 7004	7.00	250 ml in DURAN® glass bottle
285138719	L 100	10.01	1000 ml in DURAN® glass bottle
285138057	L 1004	10.01	250 ml in DURAN® glass bottle

Buffer solutions in the unique double-end ampoules offer a particularly high degree of reliability and measuring accuracy.

Hermetically sealed in the glass ampoule and sterilized with hot steam just like a pharmaceutical product, the buffer solutions free of preservation agent have an extremely long shelf life and guarantee continuously error-free characteristics.

The ampoules can be easily opened at the breaking point. Tools are not required. Since refilling is not possible, you are always ensured of maximum calibration reliability.

Solutions

Color-coded technical buffer solutions in plastic bottles

Order No.	Type No.	pH value at 25 °C	Contents
285139156	LC 4004 K	4.00	250 ml in PE bottle
285139189	LC 7004 K	7.00	250 ml in PE bottle
285139218	LC 1004 K	10.01	250 ml in PE bottle

Electrolyte solutions, aqueous
for reference electrodes and as electrolyte bridges

Order No.	Type No.	Description	Contents
285136956	L 101	potassium chloride solution 1 mol/l	1000 ml in DURAN® glass bottle, sterilized
285138649	L 1254	potassium sulfate solution 0.6 mol/l	250 ml in DURAN® glass bottle
285138151	L 200	low temperature electrolyte (-30 °C)	1000 ml in DURAN® glass bottle
285138365	L 2004	low temperature electrolyte (-30 °C)	250 ml in DURAN® glass bottle
285138349	L 2114	2 mol/l KNO_3 + 0.001 mol/l KCl for Ag combination electrodes	250 ml in DURAN® glass bottle
285136923	L 2214	2 mol/l KNO_3 + 0.001 mol/l KCl for Ag combination electrodes, thickened	250 ml in DURAN® glass bottle
285138332	L 2224	potassium chloride solution 2 mol/l	250 ml in DURAN® glass bottle
285138554	L 300	potassium chloride solution 3 mol/l	1000 ml in DURAN® glass bottle, sterilized
285138427	L 3004	potassium chloride solution 3 mol/l	250 ml in DURAN® glass bottle, sterilized
285138505	L 3008	potassium chloride solution 3 mol/l	50 ml in PE bottle
285138419	L 3014	potassium chloride solution 3 mol/l, Ag/AgCl saturated	250 ml in DURAN® glass bottle
285138468	L 310	potassium chloride solution 2 mol/l, gel for sterilizable electrodes	1000 ml in DURAN® glass bottle
285138484	L 3104	potassium chloride solution 2 mol/l, gel for sterilizable electrodes	250 ml in DURAN® glass bottle
285138702	L 320 K	potassium chloride solution 2 mol/l, gel for Ag_2S electrodes	1000 ml in DURAN® glass bottle
285138143	L 350	potassium chloride solution 3.5 mol/l	1000 ml in DURAN® glass bottle, sterilized
285138127	L 3504	potassium chloride solution 3.5 mol/l	250 ml in DURAN® glass bottle, sterilized
285138587	L 420	potassium chloride solution 4.2 mol/l	1000 ml in DURAN® glass bottle
285138608	L 4204	potassium chloride solution 4.2 mol/l	250 ml in DURAN® glass bottle

Solutions

Electrolyte solutions, organic
for measurements in organic solutions for reference electrodes and as electrolyte bridges

Order No.	Type No.	Description	Contents
285138324	L 5014	LiCl saturated in glacial acetic acid	250 ml in DURAN® glass bottle
285138308	L 5034	LiCl saturated in ethanol	250 ml in DURAN® glass bottle

Solutions for oxygen measurements

Order No.	Type No.	Description	Contents
285138513	L 6708	electrolyte for oxygen electrodes OX 1100/OX 1100+/OX 1101	50 ml in PE bottle
285126606	OX 920	electrolyte for oxygen electrodes 9009/61	50 ml in PE bottle
285126614	OX 921	cleaning solution for oxygen electrodes 9009/61	50 ml in PE bottle
285138287	OX 060	zero point solution for oxygen electrodes OX 1100/OX 1100+	60 FIOLAX® ampoules à 20 ml

Solutions for ammonia measurements

Order No.	Type No.	Description	Contents
285137344	L 6408	electrolyte for ammonia combination electrodes	50 ml in PE bottle

Solutions and accessories for conductivity measurements

Order No.	Type No.	Description	Contents
285126503	LF 990	test solution KCl 0.001 mol/l (147 µS/cm)	3 x 6 FIOLAX® ampoules à 20 ml
285126511	LF 991	test solution KCl 0.01 mol/l (1.41 mS/cm)	3 x 6 FIOLAX® ampoules à 20 ml
285126528	LF 992	test solution KCl 0.1 mol/l (12.9 mS/cm)	3 x 6 FIOLAX® ampoules à 20 ml
285126293	LF 995	test solutions KCl 0.01/0.1/1 mol/l (1.41/12.9/112 mS/cm)	3 x 6 FIOLAX® ampoules à 20 ml
285126166	LF 1000/Set	same as LF 999/set, in addition platinizing vessel and cable B 1 N	3 x 6 FIOLAX® ampoules à 20 ml
285136907	LF 1024	test solution KCl 0.01 mol/l (1.41 mS/cm)	250 ml in PE bottle
285126530	LF CSKC13	test solution KCl 1.3 µS/cm	250 ml in PE bottle
285126540	LF CSKC5	test solution KCl 5.0 µS/cm	500 ml in PE bottle

Redox test solutions

Order No.	Type No.	Redox voltage		Contents
		Pt/Calomel (KCl sat.)	Pt/Ag/AgCl (KCl 3 mol/l)	
285138373	L 4619	180 mV	220 mV	60 FIOLAX® ampoules à 20 ml, acc. to DIN 38 404-C6
285138357	L 4643	430 mV	470 mV	60 FIOLAX® ampoules à 20 ml,
285138381	L 4660	600 mV	640 mV	60 FIOLAX® ampoules à 20 ml
285138784	L 4648	180, 430, 600 mV	220, 470, 640 mV	3 x 20 FIOLAX® ampoules à 20 ml
285138184	L 430	430 mV	470 mV	1000 ml in DURAN® glass bottle
285138168	L 4304	430 mV	470 mV	250 ml in DURAN® glass bottle

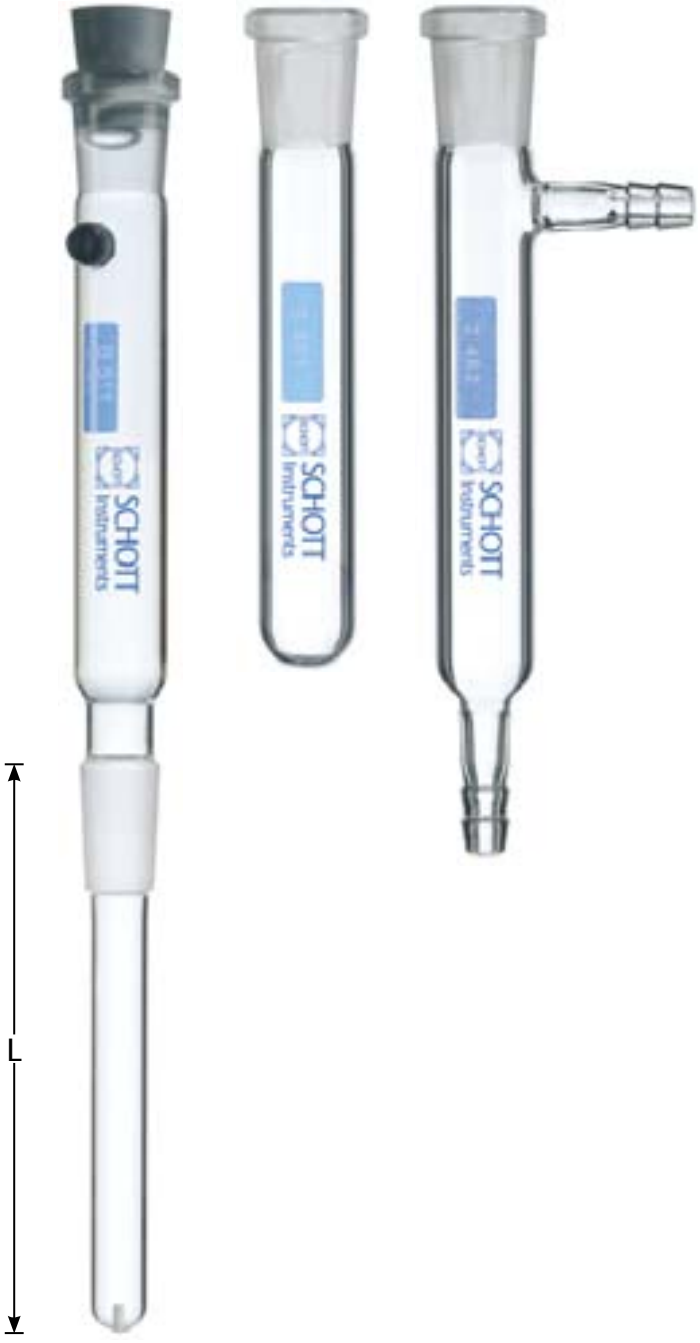
Cleaning solutions for combination electrodes and reference electrodes

Order No.	Type No.	Description	Contents
285138538	L 510	pepsin/hydrochloric acid solution	1000 ml in DURAN® glass bottle
285138295	L 5104	pepsin/hydrochloric acid solution	250 ml in DURAN® glass bottle

Electrolyte bridges, other accessories

Electrolyte bridges

Shaft: glass, 12 mm Ø



B 511 Z 451 Z 462
Z 461

Order No.	Type No.	Length L [mm]	Dia-phragm	Remarks
285104209	B 511	103[1)]	ceramic	standard taper NS 14.5 and sleeve NS 14.5 for electrode installation
285104217	B 521	120	ceramic	plastic sleeve and sleeve NS 14.5 for electrode installation
285104225	B 522	120	Pt lateral	plastic sleeve and sleeve NS 14.5 for electrode installation
285104233	B 524	120	ground joint	plastic sleeve and sleeve NS 14.5 for electrode installation

[1)] Length from upper end of standard taper

Order No.	Type No.	Description
285123806	BXX	plug for reference electrodes, single pole
285123703	KXX	coaxial plug for combination electrodes and indicator electrodes
285126482	NH 928	electrolyte for ammonia electrodes in 50 ml plastic bottle, 3 membrane modules
285126499	NH 995	membrane module set: 3 membrane modules, 3 caps
285126639	OX 923	3 spare membrane heads for oxygen electrodes 9009/61
285126655	OX 925	maintenance set (OX 920, OX 921, OX 923 and SF 300) for oxygen electrodes 9009/61
285126277	OX 929	5 spare membrane heads for oxygen electrodes OX 1100/OX 1100+/OX 1101
285126647	OxiCal® SL	calibrating vessel for oxygen electrodes 9009/61
285126622	SF 300	grinding foil for oxygen electrodes 9009/61
285123728	SXX	coaxial plug for extension cable and for UK socket
285215229	TZ 1520	taper adapter NS 14.5 of PTFE for electrodes with Ø 12 mm shaft
285123103	Z 341	stainless steel clamp for NS 7.5/16
285123136	Z 451	measuring and storage vessel with sleeve NS 7.5/16
285123152	Z 461	measuring and storage vessel with sleeve NS 14.5/23
285123169	Z 462	flow-through measuring vessel with sleeve NS 14.5/23
285123185	Z 472	watering cap for electrodes with 12 mm Ø shaft
285122961	Z 50	Knick electrode adapter
285123193	Z 501	O-Ring seal 10.5/1.5 for electrode plug head
285123214	Z 506	plug head sealing cap with male thread for KXX and BXX plugs
285129509	Z 512	plug head sealing cap with female thread for BlueLine electrodes

Index electrodes

Index accessories