



# Process Equipment

ELECTRODES | ARMATURES | METERS | ACCESSORIES

SI Analytics  
a xylem brand





# Welcome to SI Analytics!



Dear customers,

With this new catalogue we present to you our complete product range of process analytics equipment. Inside you will find our process electrodes, holders and flow-through vessels, and meters.

Electrochemical measuring methods have become increasingly important in fields such as general science, research, food and beverage production, chemical, pharmaceutical and biotech industry. We have been involved in these areas right from the very beginning and have repeatedly succeeded in generating innovative new products and technologies. We would like to draw your attention to our latest developments, which you will come across in nearly all product sections.

Our customers, to whom we would like to express our heartfelt thanks, have made an enormous contribution to our success. Your analytical requirements, thoughts and experience have encouraged us to rise to the challenge again and again. The result of this fruitful dialogue can be seen in this catalog.

We at SI Analytics look forward to a continuation of this close relationship with our customers and hope that our new catalogue will help us to support your needs.

With best regards

**Dr. Robert Reining**  
Managing Director SI Analytics GmbH

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### **TIP**

For details and/or a search for product, we offer the product finder function on our website.

Please go to:  
<http://www.si-analytics.com/en/products/product-finder.html> and type in your search terms. In an instant you will find the right product and the detailed information.

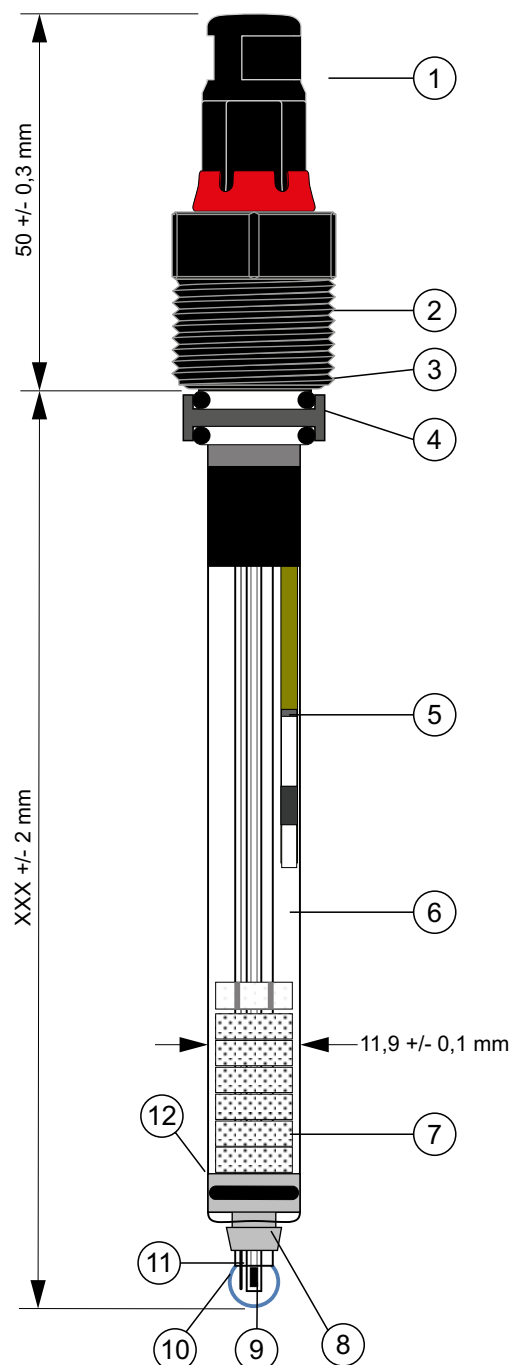
If you have further questions, please get in contact with us:  
[Info.si-analytics@xylem-inc.com](mailto:Info.si-analytics@xylem-inc.com)

# New: Electrodes with PTFE junction

The new electrode series **ProcessLine 9xx** with PTFE junction as available as both an analog and Memosens® model is the universal solution for pH measurement in process and environmental applications. The electrodes of this series work reliably and accurately, even in the most demanding media and hazardous environments. They are ideal for use in chemical industrial settings, breweries, the food industry, waste incinerators, the paper industry, power plants or plastic chemistry.

No.	Description PL 93 xxx
1	Screw plug head with Memosens® connection (Alternatively analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®) with silver ion trap
6	Rheolid® electrolyte of the reference electrode
7	KCl storage of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	Glass membrane (H-glass)
11	Internal conduction element of the pH glass electrode
12	PTFE-junction

## PL 93 XXX

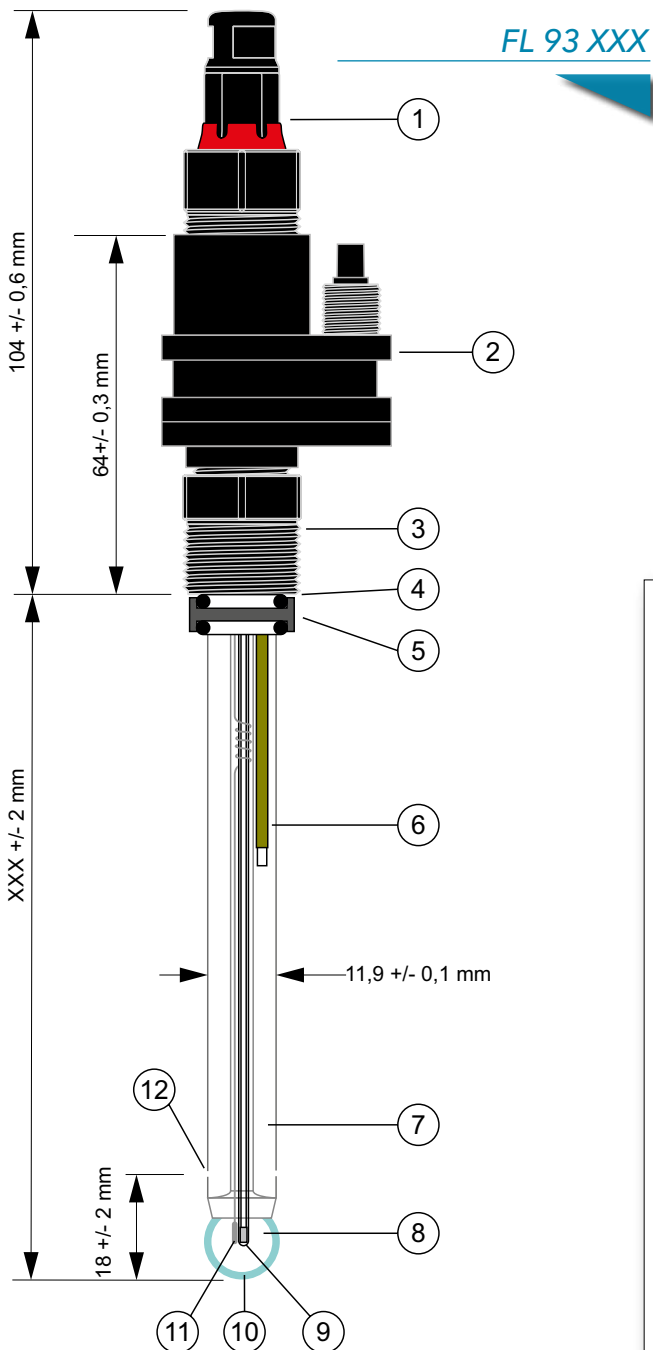


- ▶ Low maintenance
- ▶ Dirt-repellent PTFE annular junction
- ▶ Long product life due to toxin-repellent Silamid® reference system with silver ion trap and RheoLid electrolyte with KCl storage rings
- ▶ A-membrane glass for samples with low conductivity and general applications
- ▶ H-membrane glass for process applications
- ▶ Use for pressures of up to 12 bar across the entire temperature range
- ▶ For Memosens®:
  - Highest possible process safety due to contact-free, inductive signal transmission
  - Low maintenance due to storage of sensor data in the sensor head

Benefits  
at a glance

# New: Single-rod measuring cell with Liquid potassium chloride delivery

In demanding media with a very low conductivity in the low  $\mu\text{S}/\text{cm}$  range or with suspended solids up to extreme pH values, we recommend the use of pH electrodes with a liquid KCl reference electrolyte. This electrolyte is emitted to the measuring medium via the junction. This reduces junction potential leading to a more accurate measurement. The electrodes of this series work reliably and accurately, even in complex applications. Whether it be in the chemical industry, the food industry, biotechnology, waste incinerators, the paper industry, in power plants or in plastic chemistry.



No.	Description FL 93 xxx
1	Screw plug head with Memosens® connection (Alternatively analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Miniature pressure adapter (MDA), material PPSU, with screw M10x1 for tube connection (ID 4 mm, OD 6 mm) to the electrolyte reservoir
3	Screw-in thread Pg 13.5 (material PPS)
4	O-Ring 11-2.5 (material Viton®)
5	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
6	Reference element (Silamid®)
7	Liquid electrolyte of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	Glass membrane (depending on type of electrode A-, H- or S-glass)
11	Internal conduction element of the pH glass electrode
12	Junction (depending on the type of electrode ceramic, platinum or ground joint)

- ▶ Liquid electrolyte for demanding measurements
- ▶ Highest possible measuring accuracy by reducing of junction potentials
- ▶ Pressurized electrolyte prevents the junction from being plugged
- ▶ Matching electrode for every application with versatile selection of membrane glasses, with and without temperature sensor and plug heads for both analog and digital models
- ▶ For Memosens®:
  - Highest possible process safety due to contact-free, inductive signal transmission
  - Low maintenance due to storage of sensor data in the sensor head

Benefits  
at a glance

# New: MEMOSENS® Sensors

Our Memosens® program contains pH and ORP electrodes. These sensors are compatible with all Memosens® transmitters and meters available on the market. Our Memosens® sensor portfolio includes our already established ProcessLine, SteamLine, and annular-gap electrodes as well as our new FlowLine series. FlowLine is a new line of liquid-electrolyte sensors with integrated pressure adapter for hose connection for an electrolyte reservoir.

All low-maintenance Memosens® electrodes conform to ATEX standards 94/9/EG. Inspection at the EXAM in Bochum/Germany was documented with the certificate BVS 12 ATEX E 037 x. The following standards are applied: EN 60079-0 :2009; EN 60079-11 :2007; EN 60079-26 :2007. The ATEX marking is I I 1G Ex ia IIC T3/ T4/ T6 Ga.

What makes Memosens® different from other connection systems:

- Memosens® is a digital connection system
- The sensor data is stored in the measuring head
- The measuring signals are transmitted inductively, i.e. without contact
- Can even be used under water thanks to a hermetically sealed plug head



- ▶ Galvanically isolated
- ▶ Resistant against environmental influences
- ▶ High process safety
- ▶ Sensor diagnostics allow for preventative maintenance
- ▶ Memosens® is an open system, i.e., it is supported by different manufacturers

Benefits  
at a glance

Memosens® is a registered trademark of Endress+Hauser Conducta GmbH + Co. KG, Gerlingen

The sign  is a registered trademark of Endress+Hauser Conducta GmbH + Co. KG, Gerlingen and Knick Elektronische Messgeräte GmbH & Co. KG, Berlin



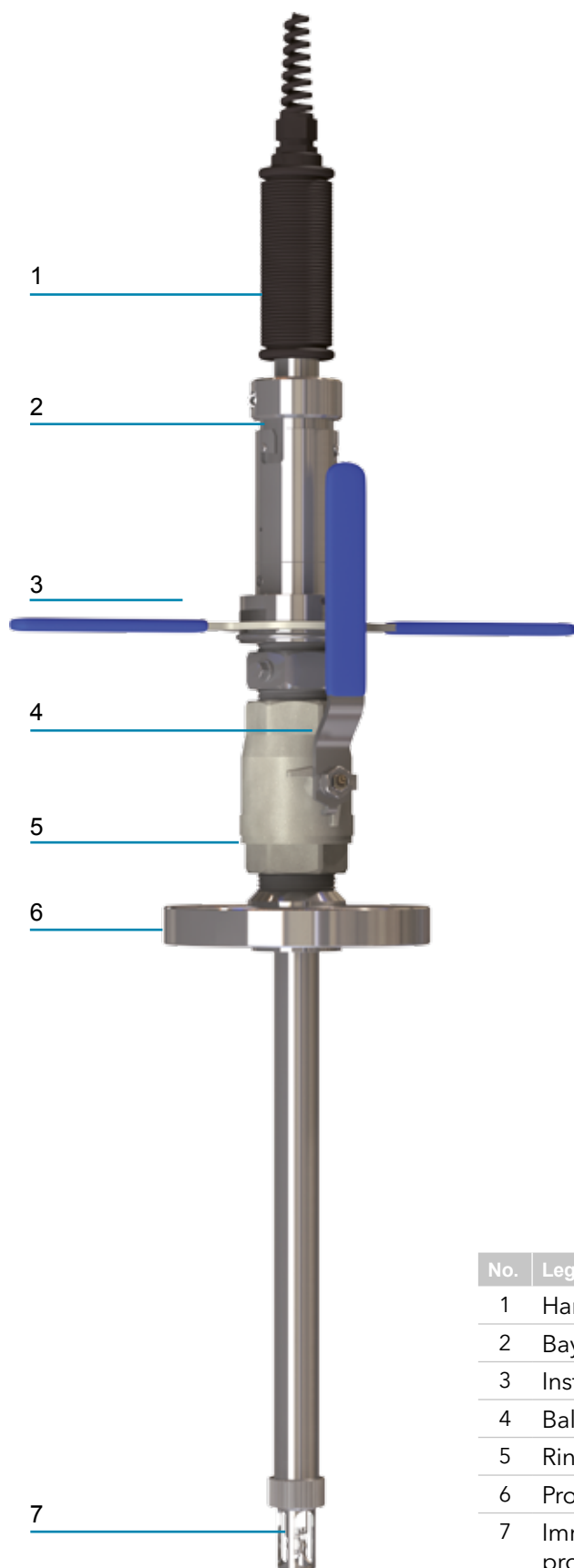
# New: CHEMtrac 840M

## Ball valve armatures

The CHEMtrac 840M is a manually driven retractable holder made from stainless steel to install Pg 13.5 Ø12 mm sensors in tanks or pipelines.

The advantages:

- New manual replacement fitting series with a mechanical linear drive for the safe retraction and extension of the sensor without interrupting the process
- Customizable to application conditions with multiple process connection, cleaning connection, and seal material options
- No special sensors necessary. Designed for low maintenance electrodes with an installation length of 120 mm, a diameter of 12 mm and Pg 13.5 thread
- Highest possible safety:
  - a. When the end position of the measuring position is reached, the bayonet lock is activated
  - b. The sensor is locked tightly in this position and cannot be removed
  - c. When removing the sensor from the process, the bayonet fitting must be unlocked. This requires a short movement into the direction of the process. If the process pressure is still applied, the bayonet lock cannot be opened. Therefore, the process pressure must be reduced in order to remove the sensor.



No.	Legend
1	Handle
2	Bayonet lock
3	Installation lever
4	Ball valve
5	Rinsing chamber
6	Process connection
7	Immersion pipe with protective basket

# 1.2 Tips and hints for successful measurement with pH and ORP electrodes

## Structure of pH single-rod measuring cells

### Problem

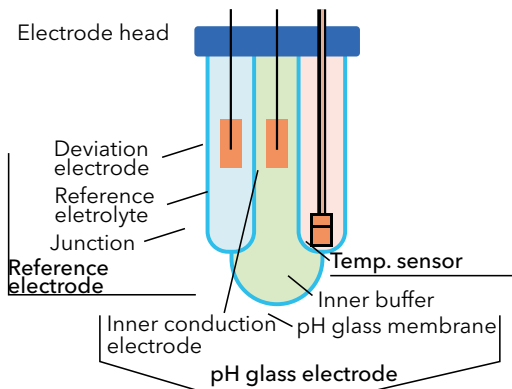
Users can select from a variety of different electrodes for pH measurement. The selection often becomes the problem. It is therefore important to understand the components of the pH electrodes including their features, so that the best electrode can be found for the application.

### Question

Which components make up a single-rod pH measuring cell and what functions do they have?

### Answer

The basic structure of pH electrodes is very simple: As potentiometric measuring chains, they consist of a measuring electrode and a reference electrode. For many years, it has been the state of the art to integrate both in a shaft as a single rod measuring cell. In addition, a large proportion of pH electrodes available on the market today already have an installed temperature sensor to automatically compensate the temperature dependence of the electrode slope in the pH meter. The construction of such pH-electrodes is described in DIN 19261 and is schematically shown in Figure 1.

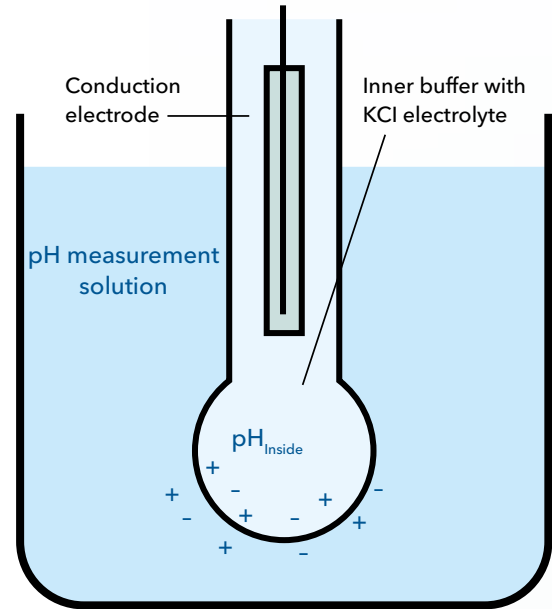


1 Structure of a single rod measuring cell

### Why does the user need a reference electrode for pH measurement?

The pH glass electrode is the measuring electrode. The pH signal is generated in mV, which is directly proportional to the pH value of the measurement

solution. However, the measurement signal can only be measured against a reference electrode. The reference electrode ideally has a stable, con-



2 The processes at the membrane of the single rod measuring cell.

stant potential independent of the pH value and the composition of the medium at all temperatures.

### What happens at the glass membrane?

The glass membrane changes due to the pH value. Under the effect of water, alkali ions dissolve from the glass surface and the oxide bridges of the silicate framework partially become OH-groups based on the absorption of water 2. This is how a "gel layer" develops. This gel layer acts on hydrogen ions as an ion exchanger.

### How does the exchange process work?

In the special pH membrane glass, a reproducible balance develops between the solution and the glass surface, which depends only on the hydrogen ion concentration in the solution and in the gel layer.

The correct measurement chain provides the highest measurement reliability and longest service life in the application.

## Conclusion

Only an electrode matching the application achieves the best measurement reliability and maximum service life. It is especially important to pay attention to the type of junction in the selection of the electrode. The junction establishes the connection between the electrode and the measuring medium. For example, the platinum junction used in sensors with liquid electrolyte, provides a fast and stable measurement with its defined electrolyte flow and resistance to penetration of the measurement medium, is for general use.

## Reference systems of pH electrodes

### Problem

Besides glass membranes and junctions, pH-electrodes differ in their reference systems. The desired application makes the choice between pH electrode reference systems easier.

### Question

What is a pH electrode reference system and why do I need it? What kind of reference systems are there for pH electrodes and what features can they provide?

### Answer

The most common method to obtain a pH measurement is by measuring a voltage. To measure a voltage the pH electrode must be able to measure the difference between two points with different electrical potential values. For a pH electrode to provide a voltage measurement of a solution's ion concentration, a reference electrode is necessary because its potential essentially remains constant and independent of the solution and temperature relative to the solution being measured. The Standard Hydrogen Electrode (SHE) is used as the international reference system. Unfortunately due to its complicated handling requirements it is not typically used for stan-

dard applications. A common approved reference system is the Saturated calomel Electrode (SCE), however this electrode contains mercury and is toxic. The most common reference system is the silver/silver chloride reference system (Ag/AgCl). However, Ag/AgCl can precipitate silver when exposed to certain samples. An alternate configuration to the standard silver/silver chloride reference system is the double junction system. A more recent reference system is the iodine/iodide system. The iodine/iodide reference system does not precipitate silver and can be used with Tris buffers. The advantages and disadvantages of different reference systems are displayed in table [▲](#). Further characteristics of the reference electrode are defined by the junction.

### Conclusion

The most important pH electrode reference system is the Ag/AgCl system because it is well described, reproducible, and nontoxic. In the few applications where this reference system does have problems the newer iodine/iodide reference system can be used instead. Due to an absence of silver ions or other contaminating metal ions the iodine/iodide reference system is an alternative when working with applications with rapidly changing temperatures. Even with quick changing pH values such as titrations, the iodine/iodide reference system is beneficial.

Reference System	Advantage	Disadvantage
Ag/AgCl	Large installed base, multifunctional, reproducible, wide temperature range, nontoxic → environmental sustainability	Reference potential depends on temperature and could deliver a different potential, if measured at a different temperature as calibrated
Hg/Hg <sub>2</sub> Cl <sub>2</sub> (Calomel)	Stable reference potential	Toxic, low temperature application range 59 to 104 °F (15 to 40 °C)
Tl,Hg/TlCl (Thalamide)	very low hysteresis, broad temperature range, low temperature coefficient	toxic, out of production
Iodine/Iodide	Low polarization, low temperature dependence, free of undesired heavy metal ions	formerly limited long-life-cycle

Table [▲](#): Advantages and disadvantages of different reference systems

## pH glass types

### Problem

There are many different pH membrane glass types available. Each pH glass has specific qualities so it should be chosen carefully to suit the measurement application.

### Question

What different kinds of pH glass are available? What are the main characteristics of these membrane glasses and which is recommended for a particular measurement application?

### Answer

Over time the glass membrane of a pH glass electrode changes. Because of exposure to water, alkali ions dissolve from the glass surface and oxide groups of the silicate become OH groups which causes a gel layer. This source layer appears to hydrogen ions as an ion exchanger. Using a special pH glass membrane there is a reproducible balance between the sample solution and glass surface, which is only dependent on the hydrogen ion concentration in the solution and the source layer.



③ Blue pH glass ball at the tip of a pH electrode.

Because pH electrodes have numerous capabilities, many different kinds of membrane glasses are needed to make accurate and reliable pH measurements for all applications. SI Analytics offers five different types: L-, H-, S-, A- and N-glass. The main characteristics of these pH glasses are:

- ▶ L: Wide application range, very low impedance resulting in accurate and rapid response times over a large temperature range ③.
- ▶ H: Optimized for higher temperatures up to 275°F (135°C) and extreme pH-values, high accuracy in stronger alkaline range (Na<sup>+</sup>)
- ▶ S: Tolerates sudden temperature changes, provides constant measurement values with fast response time in hot alkali solutions
- ▶ A: Fast response time in drinking water, surface water, sewage, and general applications
- ▶ N: At normal temperatures usable for the full pH-range and almost all kinds of samples.

The following examples illustrate the use of different membrane glass: With a strong alkaline media the so called “alkaline measuring error” appears. This error is triggered by the confusion of sodium with hydrogen ions (cross sensitivity) and causes a measurement inaccuracy beginning at a pH value of 12 in presence of sodium ions. Under extreme conditions this inaccuracy could mean a difference up to 1 pH unit. In those cases the H type glass electrode should be used.

Applications with hot alkaline exposure or sterilization by superheated steam impose great demands on the consistency of the membrane glass. Under these conditions a pH glass electrode usually ages faster and corrodes. In this case the right choice would be a S type membrane glass.

In common applications or drinking water measurements the challenge is the variety of applications and the low conductivity of samples. This could lead to slow response times and unstable or unreliable data. For these demands the A type glass has been developed. It features rapid response times and extended use.

## Care of the pH electrode

### Problem

How do pH electrodes have to be maintained and stored?

### Question

What influence does the maintenance and care have on the service life of the electrode and the accuracy of the measurement? How should the electrode be stored? What cleaning methods should be used?

### Answer

Careful handling and storage of the electrodes are elementary for reliable results. Furthermore, the durability is thereby increased. The following tips show an overview.

#### ▶ Storage:

An electrode should never be stored dry, but always in watering solution. The watering cap should be filled with the following solutions depending on the type of electrode:



- Combination electrodes and reference electrodes: Liquid electrolyte electrodes should be stored in the same solution as the internal electrolyte. Gel electrolyte electrodes should be stored in 3 mol/l KCl. Do not store a combination electrode in DI water; this will reduce the service life.

- Glass electrodes: In case of pure measurement electrodes, the wetting cap can be filled with deionized water.

If the electrode has been stored incorrectly dry, it must be wetted for at least 24 h in the above solutions before its first use. The functionality must be tested by calibrating prior to the measurement.

#### ▲ Cleaning:

Dirt deposits of any kind on the membrane surface or the junction may result in the reduction of the service life of the electrode and inaccurate measurements. The electrode should preferably be chemically and not mechanically cleaned. In the event of dirt deposits on the outside of the electrode and the junction, the following cleaning process can be performed:

- Inorganic buildup: Soak the electrode for a couple of minutes in 0.1 mol/l HCl or 0.1 mol/l NaOH. If the buildup is not removed, the solution should be slowly heated up to 50 °C before the acid or alkali concentration is increased.

- Organic buildup: Rinse the electrode with organic solvents. The membrane can be carefully and briefly wiped with a damp, lint-free, soft cloth. The resistance of the plastic shaft of the electrode to organic solvents should be noted in this treatment.

- Proteins: Place the electrode in a pepsin/HCl solution for at least 1 h.

- Sulfides on the ceramic junction: Store the electrode in a thiourea/HCl solution (7.5 % in 0.1 mol/l HCl) until the discoloration on the junction has disappeared. After cleaning, the electrode is rinsed with deionized water and placed in the electrolyte solution for at least 1 h. In addition, the electrode must be recalibrated prior to the next measurement.

#### ▲ Cleaning of the reference electrode with liquid electrolyte:

- In case of dirt/particles in the reference electrode: remove the old and refill with new electrolyte. If necessary, repeat until the dirt is removed. Some heated electrolyte (about 45 °C) can also be used. An internal chemical cleaning is not advised, since the reference system can be irreversibly damaged.

- KCl crystals in the interior: The crystals can be dissolved when heating the electrode in a water bath at 45 °C. Then the electrolyte must be completely replaced.

#### ▲ General treatment recommendations:

- After measurement, the electrode must be rinsed immediately with deionized/distilled water and stored in the recommended manner.

- The electrode is regularly inspected for dirt deposits on the membrane surface, the junction and the interior.

- Measurements in aggressive and/or hot media result in a reduction of the service life.

- When using electrodes with liquid electrolyte, the filling opening must be opened during the measurement/calibration, in order to prevent a back diffusion of the sample by the electrolyte flow. The refilling opening must be closed when storing and between the measurements.

- The use of deionized water as a storage solution for single rod measuring cells and reference electrodes reduces their service life.

- Never store the electrode dry, use it as an stirrer or clean it mechanically.

#### Conclusion

The general treatment recommendations contribute greatly to the service life extension of the electrode and thus to the accuracy of the measurement.

# First class performance - Also with process electrodes

Our electrodes are customized to the requirements of your applications and are known for their quality, reliability and long service life. We fulfill this demand by manufacturing our electrodes with the greatest precision and a great measure of care following the most modern manufacturing methods in Germany. Every single electrode must meet the strict quality guidelines of our final inspection.

## ATEX sensors in the SI Analytics program

You can select from a large range of process sensors as per the ATEX directive 94/9/EG. ATEX sensors are certified as per the device group II for zones 0 and 1 with gaseous atmospheres. They are classified as intrinsically safe as per spark protection type "ia" and can be used in the most common temperature classes. Furthermore, they fulfill the connection class requirements pHISCO as per the NAMUR recommendation. The quality assurance system of SI Analytics GmbH was audited regarding the production of ATEX sensors as per DIN EN ISO/IEC 80079-34 by the TÜV Süd and received a respective certificate.

Our electrodes are as diversified as their application in the process. They include pH single rod measuring chains with and without integrated temperature sensors, with liquid or solid electrolyte, separate glass and reference electrodes for the extreme use, electrolyte key, resistance thermometer, conductivity measuring cells and multi-sensors, just to name a few.

The **SteamLine electrode** is the long sought after allround solution for process applications in chemicals, pharmaceuticals and biotechnology. It is designed to be used in a SIP treatment (sterilization in place) and a CIP cleaning (clean in place), which uses hot concentrated caustic soda. And the fact that electrodes that were designed for these cleaning processes show their strength in the most demanding use conditions, almost speaks for itself. Due to the low maintenance model with integrated pressurization, no electrolyte must be added. This

ensures a reliable and reproducible measurement and that fouling of the reference system is mostly avoided. Compared to pressure-free, low maintenance electrodes, the service life of SteamLine electrodes is therefore significantly better.

The new electrode series **ProcessLine 9xx** with PTFE junction as available as both an analog and Memosens® model is the universal solution for pH measurement in process and environmental applications. The electrodes of this series work reliably and accurately, even in the most demanding media and hazardous environments. They are ideal for use in chemical industrial settings, breweries, the food industry, waste incinerators, the paper industry, power plants or plastic chemistry.

The **AquaLine product line** was developed specifically for water measurements. Here, pH electrodes with or without integrated temperature sensors as well as ORP electrodes cover the common applications in drinking water, usage water and wastewater. They offer a long service life with little maintenance as all pH electrodes are delivered with a reference electrolyte solidified with a gel or polymer (Referid®). In greatly contaminated water, electrode types with Referid® electrolyte prove their strength, along with the symmetrical annular gap junction.

The **product line FlowLine** with liquid KCl adding for measurements in the most demanding media of very low conductivity in the lower  $\mu\text{S}/\text{cm}$  range or with suspended materials, solids all the way to extreme pH values.

pH electrodes with a pressurized liquid KCl reference are recommended because they reduce junction potentials that cause measurement errors, improve sensor response time by increasing the conductivity in the vicinity of the electrode, and prevent blockage and fouling of the reference system.

*All low maintenance Memosens® electrodes are approved as per the ATEX directive 94/9/EG. The testing took place at the EXAM in Bochum and was documented by means of the type examination certificate BVS 12 ATEX E 037 x.*

### Electrodes with Memosens® plug head

Our Memosens® program includes pH electrodes and ORP electrodes. These sensors are compatible with all Memosens® transmitters and meters available on the market. Our Memosens® sensor portfolio includes our already established ProcessLine, SteamLine, and annular-gap electrodes as well as our new FlowLine series. FlowLine is a new line of liquid-electrolyte sensors with integrated pressure adapter for hose connection for an electrolyte reservoir.

### What is the difference between Memosens® and other connection systems?

- Memosens® is a digital connection system
- The sensor data is stored in the measuring head
- The measuring signals are transmitted inductively, i.e. contact-free
- Absolutely waterproof and resistant against environmental influences

### Which advantages does Memosens® offer?

- Memosens® is an open system, i.e. it is supported by different manufacturers
- High process safety
- Preventive maintenance
- Perfect galvanized separation



Electrode series		ProcessLine					
		PL 8x-xxx	PL-S-8x-xxx	PL A-9x-XXX	PL H-9x-XXX	PL 99-xxx	
Exemplary sensors							
Application	pH	0-14	0-14	0-14	0-14	-	
	T/°C	0-130	0-130	0-110	0-135	0-135	
	T/°F	32-266	32-266	32-230	32-275	32-275	
	p/bar	1-12	1-12	1-12	1-12	1-12	
	p/psi abs.	14-172	14-172	14-172	14-172	14-172	
Composition	type	pH+ref	pH+ref	pH+ref	pH+ref	ORP + T	
	reference system	polymer	polymer	polymer	polymer	polymer	
	junction type	2 x hole	2 x hole	PTFE	PTFE	PTFE	
	pH glass	H	S	A	H	-	
<b>Application</b>							
Industrial Processes	chemical processes	■	■	■	■	■	
	dyes	■	■	■	■	■	
	petrochemical	■		■		■	
	paper	■	■	■	■	■	
	flue gas desulfurization		■			■	
	bases, extreme		■		■	■	
	acids, extreme			■	■	■	
	low temperatures			■		■	
	modest organic content < 20%	■					
	high organic content			■		■	
	HF-content			■		■	
Food and beverage production	beer/mash			■		■	
	wine			■		■	
	fruit juice			■		■	
	soft drinks			■		■	
	dairy products					■	
	jam/jelly			■		■	
	sugar industry		■			■	
	drinking water	■		■		■	
Pharmaceutical Industry	bio technology				■		
	fermenter						
	pharmaceutical industry				■		
Cosmetics	cream	■		■	■		
	lotion	■		■			
Detergent	germicide	■		■			
	cleaning agent	■		■			
	tenside solution	■		■			
Water	sewage water			■		■	
	demineralization/ ion exchanger			■			
	boiler feed water			■			
	ultrapure water			■			
	saline solution/ brine				■	■	



	KPG annular gap dia		Gel electrodes		SteamLine and sterilizable electrodes		
	H8xxx	L8xxx	A7781	H738x	SL-PETR-xxx-VP	SL 8x-xxx	Ster S 26xxx
	2-13	2-12	0-14	0-14	0-14	0-14	0-14
	0-100	-5-80	-5-80	-5-80	0-140	0-140	10-135
	32-212	23-176	23-176	23-176	32-284	32-284	50-275
	1-12	1-12			1-12	1-12	1-6
	14-172	14-172			14-172	14-172	14-84
	pH+ref	pH+ref	pH+ref	pH+ref	pH+ref + temp+ ORP	pH+ref	pH+ref
	polymer	polymer	gel	gel	gel	gel	liq
	Annular Gap	Annular Gap	3xcer	3xcer	cer	cer	cer
	H	A	A	H	S	S	S
	■			■			
	■			■			
				■			
					■	■	
		■	■				
			■		■	■	
		■					
			■		■	■	■
					■	■	■
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		■	■				
	■			■			

Electrodes

# Application chart

Electrode series Exemplary sensors		FlowLine		
		H9X-xxx	A9x-xxx	S9x-xxx
Application	pH	0-14	0-14	0-14
	T/°C	10-135	-30-100	10-135
	T/°F	50-275	-22-212	50-275
	p/bar	1-6	1-6	1-6
	p/psi abs.	14-84	14-84	14-84
Composition	type	pH+ref	pH+ref	pH+ref
	reference system	liq	liq	liq
	junction type	Pt/cer/ sleeve	Pt/cer/ sleeve	Pt/cer/ sleeve
	pH glass	H	A	S
<b>Application</b>				
Industrial Processes	chemical processes	■	■	■
	dyes	■	■	■
	petrochemical	■	■	■
	paper	■	■	■
	flue gas desulfurization	■	■	■
	bases, extreme		■	■
	acids, extreme		■	■
	low temperatures		■	
	modest organic content < 20%		■	
	high organic content		■	
	HF-content		■	
	Food and beverage production	beer/mash		■
wine			■	
fruit juice			■	
soft drinks			■	
dairy products			■	
jam/jelly			■	
sugar industry			■	
drinking water			■	
Pharmaceutical Industry	bio technology	■	■	
	fermenter		■	
	pharmaceutical industry		■	
Cosmetics	cream		■	
	lotion		■	
Detergent	germicide		■	
	cleaning agent		■	
	tenside solution		■	
Water	sewage water		■	
	demineralization/ion exchanger		■	
	boiler feed water		■	
	ultrapure water		■	
	saline solution/brine		■	

Specialists-/separated electrodes					
L1181	H1181	S1181	N2981	B1181	B1881
0-12	0-14	0-14	0-14		
-30-80	0-135	10-135	0-50	0-50	0-100
-22-176	32-275	50-275	32-122	32-122	32-212
1-12	1-12	1-12			
14-172	14-172	14-172			
pH	pH	pH	pH	ref	ref
-	-	-	-	gel	gel
-	-	-	-	cer	PVDF
A	H	S	N	-	-
	■	■		■	■
	■	■		■	■
	■	■		■	■
	■	■		■	■
		■		■	■
		■		■	■
■	■			■	
■				■	
■			■		■
■					
■					
■					
■					
■					

## 2.3.1 SteamLine electrodes

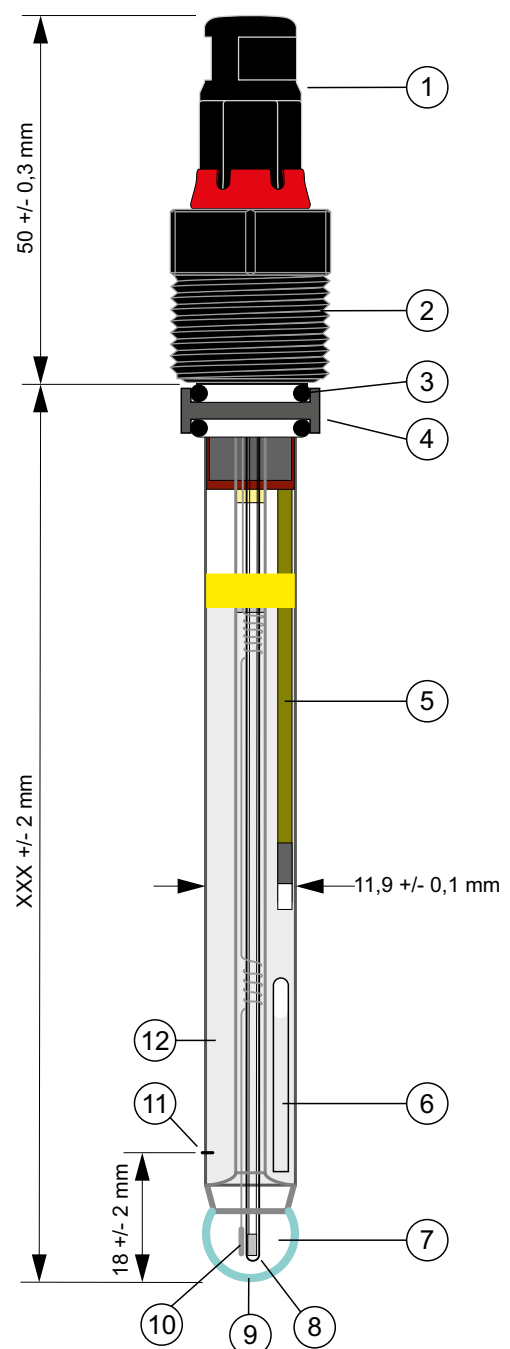
### Low maintenance pH and ORP electrodes

The SteamLine series of electrodes are low maintenance, sterilizable, and provide long-term measurement stability. It is the long sought after all-around solution for pH, ORP and temperature measurements in the most severe conditions in process chemistry, the food and beverage and pharmaceutical industry. **SteamLine electrodes are designed for use in SIP treatment (sterilization in place) and CIP cleaning (clean in place)**, which uses hot concentrated caustic soda. The fact that these electrodes were designed for these cleaning processes shows their durability in the most demanding conditions.

A special feature is the **pressurized reference electrode**. The viscosity of the electrolyte is optimized in a way that it exits the junction just slowly enough to prevent clogging the pores. This ensures its extraordinary measuring qualities for an extended period of time and a toxification of the reference system prevents fouling of the reference system. Compared to pressure-free, low maintenance electrodes, the usage time of SteamLine electrodes is therefore significantly longer.

No.	Description SL 83 xxx
1	Screw plug head with Memosens® connection (Alternatively, analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material EPDM)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®) with silver ion trap
6	Manometer for the pressurization of the reference electrode
7	Inner buffer of the pH glass electrode
8	Temperature sensor (NTC 30 kOhm)
9	Glass membrane (S-glass)
10	Internal conduction element of the pH glass electrode
11	Junction (ceramic)
12	Pressurized Rheolid®-gelelectrolyte (KCl saturated) of the reference electrode

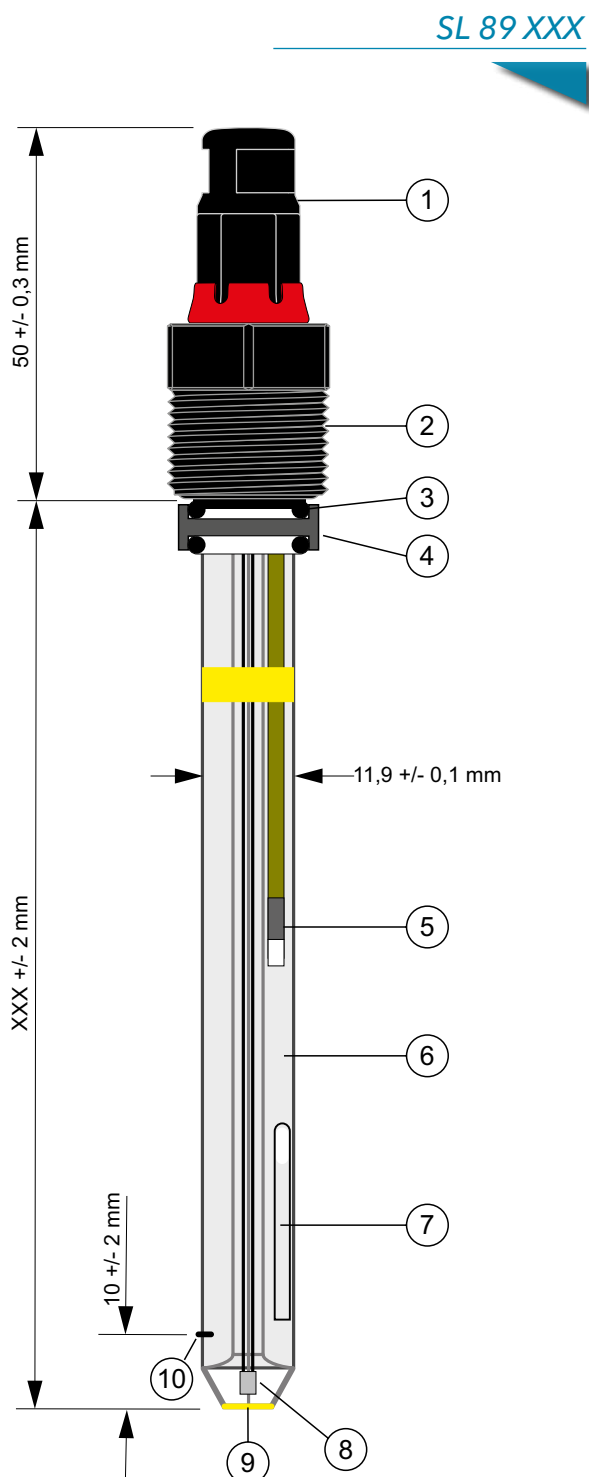
#### SL 83 XXX





For "SteamLine" electrodes, the proven **S-membrane glass** is used, this allows the sensor to avoid damage from hot caustic soda (90-95°C). "SteamLine" electrodes allow up to 100 sterilizations with overheated water vapor at about 135°C, as used in the pharmaceutical industry. Thus, they can be cleaned or sterilized while still installed.

With its selection of installation lengths, measuring parameters, and connection heads (Coax, VP, Memosens), the SteamLine series will have the right pH/ORP sensor for your application.



No.	Description SL 89 xxx
1	Screw plug head with Memosens® connection (Alternatively, analog electrodes with coax- plug head)
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material EPDM)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®) with silver ion trap
6	Pressurized Rheolid®-gel electrolyte (KCl saturated) of the reference electrode
7	Manometer for the pressurization of the reference electrode
8	Temperature sensor (NTC 30 kOhm)
9	Platinum blank
10	Junction (ceramic)

- ▶ Low maintenance, long lasting, stable pH and ORP electrodes with internal pressurization.
- ▶ CIP- (Clean In Place) and SIP-capable (Steam In Place) for the strictest requirements for cleanliness in the areas of food, pharmaceuticals and biotechnology.
- ▶ Its CIP and SIP capability validates it for the most demanding process requirements.
- ▶ Multiple models with or without temperature sensor in several installation lengths as well as analog and digital Memosens® models.
- ▶ For Memosens®:
  - Highest possible process safety due to contact-free, inductive signal transmission
  - Low maintenance due to storage of sensor data in the sensor head

Benefits  
at a glance

# SteamLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
SL 80-120pH	285113213	Low-maintenance pH combination electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® reference, ceramic junction, pressurized RheoLid ref. system, sphere membrane, S glass, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °	pH	0..14	0..140	1..12
SL 80-225pH	285113246	Low-maintenance pH combination electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® reference, ceramic junction, pressurized RheoLid ref. system, sphere membrane, S glass, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °	pH	0..14	0..140	1..12
SL 80-325pH	285113254	Low-maintenance pH combination electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® reference, ceramic junction, pressurized RheoLid ref. system, sphere membrane, S glass, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °	pH	0..14	0..140	1..12
SL 80-360pH	285113468	Low-maintenance pH combination electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® reference, ceramic junction, pressurized RheoLid ref. system, sphere membrane, S glass, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...140 °	pH	0..14	0..140	1..12
SL 80-425pH	285113262	Low-maintenance pH combination electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® reference, ceramic junction, pressurized RheoLid ref. system, sphere membrane, S glass, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °	pH	0..14	0..140	1..12
SL 81-120pHT VP	285113308	Low-maint. pH comb. electrode with Pt 1000, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 81-225pHT VP	285113316	Low-maint. pH comb. electrode with Pt 1000, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 81-325pHT VP	285113324	Low-maint. pH comb. electrode with Pt 1000, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 81-425pHT VP	285113332	Low-maint. pH comb. electrode with Pt 1000, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 82-120pHT VP	285113365	Low-maint. pH comb. electrode with Pt 100, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 82-225pHT VP	285113373	Low-maint. pH comb. electrode with Pt 100, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 82-325pHT VP	285113381	Low-maint. pH comb. electrode with Pt 100, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 82-360pHT VP	285113585	Low-maint. pH comb. electrode with Pt 100, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 82-425pHT VP	285113398	Low-maint. pH comb. electrode with Pt 100, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-120 NMSN	285114025	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-225 NMSN	285114035	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-325 NMSN	285114045	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
S	500	7.0	ceramic	RheoLid	glass	12	120		S8
S	500	7.0	ceramic	RheoLid	glass	12	225		S8
S	500	7.0	ceramic	RheoLid	glass	12	325		S8
S	500	7.0	ceramic	RheoLid	glass	12	360		S8
S	500	7.0	ceramic	RheoLid	glass	12	425		S8
S	500	7.0	ceramic	RheoLid	glass	12	120	Pt1000	VP
S	500	7.0	ceramic	RheoLid	glass	12	225	Pt1000	VP
S	500	7.0	ceramic	RheoLid	glass	12	325	Pt1000	VP
S	500	7.0	ceramic	RheoLid	glass	12	425	Pt1000	VP
S	500	7.0	ceramic	RheoLid	glass	12	120	Pt100	VP
S	500	7.0	ceramic	RheoLid	glass	12	225	Pt100	VP
S	500	7.0	ceramic	RheoLid	glass	12	325	Pt100	VP
S	500	7.0	ceramic	RheoLid	glass	12	360	Pt100	VP
S	500	7.0	ceramic	RheoLid	glass	12	425	Pt100	VP
S	500	7.0	ceramic	RheoLid	glass	12	120	NTC 30	Memosens®
S	500	7.0	ceramic	RheoLid	glass	12	225	NTC 30	Memosens®
S	500	7.0	ceramic	RheoLid	glass	12	325	NTC 30	Memosens®

# SteamLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
SL 83-360 NMSN	285114055	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-425 NMSN	285114065	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 89-120 NMSN	285114075	Low-maintenance metal comb. Electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...140 °C	ORP +T	n.a.	0..140	1..12
SL 89-120Pt	285113402	Low-maintenance metal comb. electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, screw plug head, length 120 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
SL 89-225 NMSN	285114085	Low-maintenance metal comb. Electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...140 °C	ORP +T	n.a.	0..140	1..12
SL 89-225Pt	285113419	Low-maintenance metal comb. electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, screw plug head, length 225 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
SL 89-325Pt	285113427	Low-maintenance metal comb. electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, screw plug head, length 325 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
SL 89-425Pt	285113443	Low-maintenance metal comb. electrode, hot steam sterilizable, CIP and SIP able, glass shaft, SILAMID® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, screw plug head, length 425 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
SLA-81-120pHT VP TT	285113390	Low-maint. pH comb. electrode with Pt 1000, low temperature version, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, A glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -15...+100 °C	pH + T	0..14	-15.. 100	1..12
SLA-81-225pHT VP TT	285113400	Low-maint. pH comb. electrode with Pt 1000, low temperature version, glass shaft, SILAMID® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, A glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -15...+100 °C	pH + T	0..14	-15.. 100	1..12
SL PETR-120 VP	285114705	Low-maint. pH metal comb. electr. with Pt 1000, CIP and SIP able, glass shaft, SILAMID® ref. with silver ion trap, ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, platinum disk, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+ORP+T	0..14	0..140	0..14
SL PETR-225 VP	285114710	Low-maint. pH metal comb. electr. with Pt 1000, CIP and SIP able, glass shaft, SILAMID® ref. with silver ion trap, ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, platinum disk, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+ORP+T	0..14	0..140	0..14
SL PETR-325 VP	285114715	Low-maint. pH metal comb. electr. with Pt 1000, CIP and SIP able, glass shaft, SILAMID® ref. with silver ion trap, ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, platinum disk, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+ORP+T	0..14	0..140	0..14
SL PETR-360 VP	285114720	Low-maint. pH metal comb. electr. with Pt 1000, CIP and SIP able, glass shaft, SILAMID® ref. with silver ion trap, ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, platinum disk, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+ORP+T	0..14	0..140	0..14
SL PETR-425 VP	285114725	Low-maint. pH metal comb. electr. with Pt 1000, CIP and SIP able, glass shaft, SILAMID® ref. with silver ion trap, ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, platinum disk, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+ORP+T	0..14	0..140	0..14

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
S	500	7.0	ceramic	RheoLid	glass	12	360	NTC 30	Memosens®
S	500	7.0	ceramic	RheoLid	glass	12	425	NTC 30	Memosens®
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	120	NTC 30	Memosens®
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	120	nein	S8
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	225	NTC 30	Memosens®
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	225	nein	S8
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	325	nein	S8
platinum circle	n.a.	n.a.	ceramic	RheoLid	glass	12	425	nein	S8
A		7.0	ceramic	RheoLid	glass	12	120	Pt1000	VP
A		7.0	ceramic	RheoLid	glass	12	225	Pt1000	VP
S + platinum disc	500	7.0	ceramic	RheoLid	glass	12	120	Pt1000	VP
S + platinum disc	500	7.0	ceramic	RheoLid	glass	12	225	Pt1000	VP
S + platinum disc	500	7.0	ceramic	RheoLid	glass	12	325	Pt1000	VP
S + platinum disc	500	7.0	ceramic	RheoLid	glass	12	360	Pt1000	VP
S + platinum disc	500	7.0	ceramic	RheoLid	glass	12	425	Pt1000	VP

## 2.3.2 ProcessLine - Electrodes for most process applications

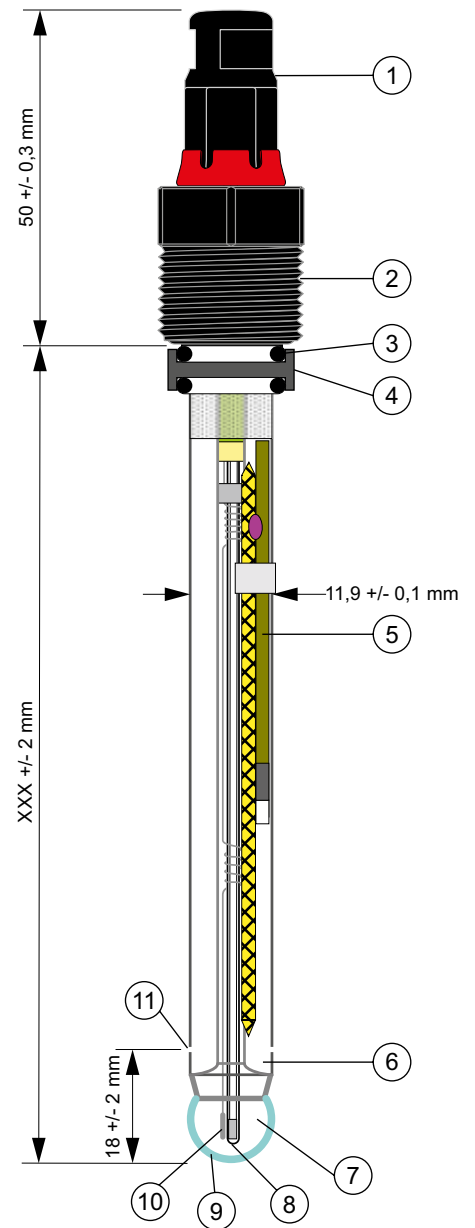
ProcessLine electrodes are low maintenance sensors for pH, ORP and temperature measurements for the toughest process applications, especially in the chemical industry. They are suitable for measurement in media with extreme ion strength, from boiler feed water to brine, as well as for strongly oxidizing as well as acidic and alkaline media.

Their special construction makes the ProcessLine electrodes very close to the performance of liquid electrolyte electrodes regarding their accuracy, stability, speed and longevity. Because the ProcessLine does not require refilling of electrolyte, they require much less maintenance and calibration. These sensors have a high potential for reducing ownership costs.

In addition to the multitude of measuring parameters, installation lengths, membrane glasses and connecting heads, you can also choose between **hole and PTFE annular junctions**. The electrodes of the PL8x series have two open connections in direct contact with the measuring medium, while the electrodes of the PL9x series are equipped with a PTFE junction. Both models minimize the risk for contamination/blocking of the junction, the main source of measuring errors, as well as the failure of the single rod measuring chain.

The **Duralid solid electrolyte with a high KCl content in the PL8x models** reduces measurement interference due to diffusion potentials at the transition of the two hole junctions from the reference electrode to the measuring medium. This not only prolongs sensor life and improves response time, but also allows for a more stable measured value; even under adverse conditions like changing flow/agitator speeds and media containing solvents.

PL 83 XXX NMSN



No.	Description PL 83 xxx NMSN
1	Screw plug head with Memosens® connection (Alternatively, analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®)
6	Duralid-gel electrolyte (KCl saturated) of the reference electrode
7	Inner buffer of the pH glass electrode
8	Temperature sensor (NTC 30 kOhm)
9	Glass membrane (H-glass)
10	Internal conduction element of the pH glass electrode
11	Hole junction

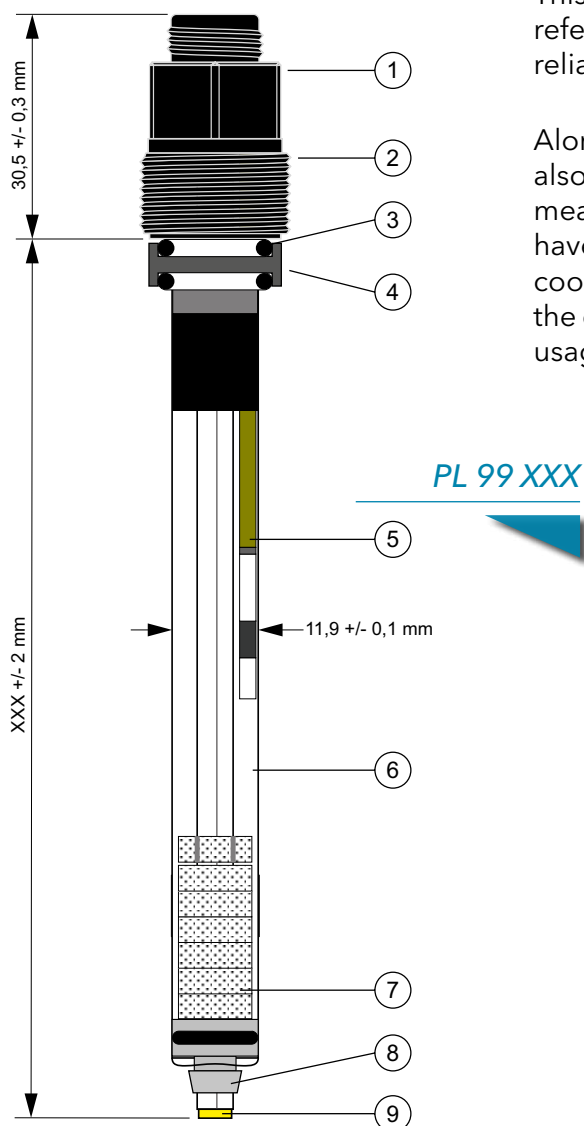


**The reference system of the PL9X versions consists of:**

- RheoLid electrolyte with KCl storage rings
- The toxification-resistant silamid conduction with silver ion trap
- Dirt-repellent PTFE annular junction

This equipment prevents toxification and blockage of the reference electrode. This ensures a long product life and a very reliable measuring behavior.

Along with the reference electrode, the measuring electrode also bears importance for the speed and accuracy of the measurement. The glass electrodes of the ProcessLine series have special membrane glasses that were optimized in cooperation with our customers to perfection for process use in the course of decades. These glasses boast a large temperature usage range and very few alkaline errors.



No.	Description PL 99 xxx
1	Screw plug head with coax- plug head
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton® )
4	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
5	Reference element (Silamid®) with silver ion trap
6	Rheolid®-electrolyte of the reference electrode
7	KCl storage tablets of the reference electrode
8	PTFE junction
9	Platinum blank

- ▶ Low maintenance, e.g. no refilling of electrolyte necessary.
- ▶ Hole junctions (PL8x) or PTFE annular junctions (PL9x), therefore no contamination or blockage of the reference electrode.
- ▶ Longevity as well as quick and stable measured values by means of Duralid (PL8x) or RheoLid(PL9x) reference electrolytes.
- ▶ Process-proven membrane glass with very low alkaline errors (H-glass) and optimized spherical shape.
- ▶ PTFE annular junction electrodes (PL9x) with silver ion barrier.
- ▶ For use in media with extreme ion strengths, strongly oxidizing features, high alkaline or acid content or solvents.
- ▶ Pressure and temperature range of up to 12 bar and 110°C (PL9x) or 135°C (PL8x).
- ▶ Installation lengths of 120, 225, 325, 360 and 425 mm with and without temperature sensors in analog and digital Memosens® models.
- ▶ For Memosens®:
  - Highest possible process safety by contact-free, inductive signal transmission
  - Low maintenance due to storage of sensor data in the sensor head

**Benefits  
at a glance**

# ProcessLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
PL 80-120pH	285113490	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH	0..14	0..130	1..12
PL 80-225pH	285113720	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH	0..14	0..130	1..12
PL 80-325pH	285113780	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH	0..14	0..130	1..12
PL 80-360pH	285113790	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH	0..14	0..130	1..12
PL 80-425pH	285113800	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH	0..14	0..130	1..12
PL 81-120pHT VP	285113550	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 81-225pHT VP	285113560	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 81-325pHT VP	285113570	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 81-360pHT VP	285113580	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 81-425pHT VP	285113590	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 82-120pHT VP	285113650	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 82-225pHT VP	285113660	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 82-325pHT VP	285113670	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 82-360pHT VP	285113680	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 82-425pHT VP	285113690	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 83-120 NMSN	285113495	Low-maintenance pH combination electrode with NTC 30K, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 83-225 NMSN	285113505	Low-maintenance pH combination electrode with NTC 30K, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 83-325 NMSN	285113515	Low-maintenance pH combination electrode with NTC 30K, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 83-360 NMSN	285113525	Low-maintenance pH combination electrode with NTC 30K, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	2 hole	DuraLid	glass	12	120		S8
H	300	7	2 hole	DuraLid	glass	12	225		S8
H	300	7	2 hole	DuraLid	glass	12	325		S8
H	300	7	2 hole	DuraLid	glass	12	360		S8
H	300	7	2 hole	DuraLid	glass	12	425		S8
H	300	7	2 hole	DuraLid	glass	12	120	Pt1000	VP
H	300	7	2 hole	DuraLid	glass	12	225	Pt1000	VP
H	300	7	2 hole	DuraLid	glass	12	325	Pt1000	VP
H	300	7	2 hole	DuraLid	glass	12	360	Pt1000	VP
H	300	7	2 hole	DuraLid	glass	12	425	Pt1000	VP
H	300	7	2 hole	DuraLid	glass	12	120	Pt100	VP
H	300	7	2 hole	DuraLid	glass	12	225	Pt100	VP
H	300	7	2 hole	DuraLid	glass	12	325	Pt100	VP
H	300	7	2 hole	DuraLid	glass	12	360	Pt100	VP
H	300	7	2 hole	DuraLid	glass	12	425	Pt100	VP
H	300	7	2 hole	DuraLid	glass	12	120	NTC30	Memosens®
H	300	7	2 hole	DuraLid	glass	12	225	NTC30	Memosens®
H	300	7	2 hole	DuraLid	glass	12	325	NTC30	Memosens®
H	300	7	2 hole	DuraLid	glass	12	360	NTC30	Memosens®

# ProcessLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
PL 83-425 NMSN	285113535	Wartungsarme pH-Einstabmessk. mit NTC 30K, glasschaft, Silamid®-Ableitung, 2 Loch-Junctionen, DuraLid Bezugssystem, Kugelmembran, H-glass, Memosens®-Schraubsteckkopf, Länge 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 89-120 NMSN	285113565	Wartungsarme ORP-Einstabmesskette mit NTC 30K, glasschaft, Silamid®-Ableitung, 2 Loch-Junctionen, DuraLid Bezugssystem, Sensor Platin-Scheibe, Memosens®-Schraubsteckkopf, Länge 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL 89-225 NMSN	285113575	Low-maintenance metal combination electrode with NTC 30K, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP + T	n.a.	0..130	1..12
PL 89-120Pt	285113700	Low-maintenance metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL 89-225Pt	285113710	Low-maintenance metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL 89-325Pt	285113750	Low-maintenance metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL 89-360Pt	285113760	Low-maintenance metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL 89-425Pt	285113770	Low-maintenance metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL PETR-120 VP	285113740	Low-maintenance pH metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, dome membrane, A glass, platinum ring, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + ORP + T	0..14	0..130	1..12
PL PETR-225 VP	285114430	Low-maintenance pH metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, dome membrane, A glass, platinum ring, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + ORP + T	0..14	0..130	1..12
PL PETR-325 VP	285114440	Low-maintenance pH metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, dome membrane, A glass, platinum ring, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + ORP + T	0..14	0..130	1..12
PL PETR-360 VP	285114450	Low-maintenance pH metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, dome membrane, A glass, platinum ring, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + ORP + T	0..14	0..130	1..12
PL PETR-425 VP	285114470	Low-maintenance pH metal combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, dome membrane, A glass, platinum ring, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + ORP + T	0..14	0..130	1..12
PL-S 82-225pHT VP	285113605	Low-maintenance pH combination electrode with Pt 100, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, sphere membrane, S glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH + T	0..14	0..130	1..12
PL A-90-120 pH	285114480	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH	0..14	0..110	1..12
PL A-90-225 pH	285114485	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH	0..14	0..110	1..12
PL A-90-325 pH	285114490	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH	0..14	0..110	1..12
PL A-90-360 pH	285114495	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH	0..14	0..110	1..12
PL A-90-425 pH	285114500	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH	0..14	0..110	1..12
PL H-90-120 pH	285114505	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH	0..14	0..135	1..12
PL H-90-225 pH	285114510	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH	0..14	0..135	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	2 hole	DuraLid	glass	12	425	NTC30	Memosens®
platinum circle	n.a.	7	2 hole	DuraLid	glass	12	120	NTC30	Memosens®
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	225	NTC30	Memosens®
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	120		S8
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	225		S8
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	325		S8
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	360		S8
platinum circle	n.a.	n.a.	2 hole	DuraLid	glass	12	425		S8
A glass + Pt ring	500	7	2 hole	DuraLid	glass	12	120	Pt1000	VP
A glass + Pt ring	500	7	2 hole	DuraLid	glass	12	225	Pt1000	VP
A glass + Pt ring	500	7	2 hole	DuraLid	glass	12	325	Pt1000	VP
A glass + Pt ring	500	7	2 hole	DuraLid	glass	12	360	Pt1000	VP
A glass + Pt ring	500	7	2 hole	DuraLid	glass	12	425	Pt1000	VP
S	500	7	2 hole	DuraLid	glass	12	225	Pt100	VP
A	300	7	PTFE	Rheolid	glass	12	120		S8
A	300	7	PTFE	Rheolid	glass	12	225		S8
A	300	7	PTFE	Rheolid	glass	12	325		S8
A	300	7	PTFE	Rheolid	glass	12	360		S8
A	300	7	PTFE	Rheolid	glass	12	425		S8
H	300	7	PTFE	Rheolid	glass	12	120		S8
H	300	7	PTFE	Rheolid	glass	12	225		S8



# ProcessLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
PL H-90-325 pH	285114515	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH	0..14	0..135	1..12
PL H-90-360 pH	285114520	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH	0..14	0..135	1..12
PL H-90-425 pH	285114525	Low-maint. pH comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH	0..14	0..135	1..12
PL A-91-120 pHT VP	285114530	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-91-225 pHT VP	285114535	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-91-325 pHT VP	285114540	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-91-360 pHT VP	285114545	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-91-425 pHT VP	285114550	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL H-91-120 pHT VP	285114555	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-91-225 pHT VP	285114560	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-91-325 pHT VP	285114565	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-91-360 pHT VP	285114570	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-91-425 pHT VP	285114575	Low-maint. pH comb. Electrode with Pt1000, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL A-93-120 NMSN	285114580	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-93-225 NMSN	285114585	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-93-325 NMSN	285114590	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-93-360 NMSN	285114595	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL A-93-425 NMSN	285114600	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL H-93-120 NMSN	285114605	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-225 NMSN	285114610	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	PTFE	Rheolid	glass	12	325		S8
H	300	7	PTFE	Rheolid	glass	12	360		S8
H	300	7	PTFE	Rheolid	glass	12	425		S8
A	300	7	PTFE	Rheolid	glass	12	120	Pt1000	VP
A	300	7	PTFE	Rheolid	glass	12	225	Pt1000	VP
A	300	7	PTFE	Rheolid	glass	12	325	Pt1000	VP
A	300	7	PTFE	Rheolid	glass	12	360	Pt1000	VP
A	300	7	PTFE	Rheolid	glass	12	425	Pt1000	VP
H	300	7	PTFE	Rheolid	glass	12	120	Pt1000	VP
H	300	7	PTFE	Rheolid	glass	12	225	Pt1000	VP
H	300	7	PTFE	Rheolid	glass	12	325	Pt1000	VP
H	300	7	PTFE	Rheolid	glass	12	360	Pt1000	VP
H	300	7	PTFE	Rheolid	glass	12	425	Pt1000	VP
A	200	7	PTFE	Rheolid	glass	12	120	NTC30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	225	NTC30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	325	NTC30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	360	NTC30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	425	NTC30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	120	NTC30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	225	NTC30	Memosens®

# ProcessLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
PL H-93-325 NMSN	285114615	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-360 NMSN	285114620	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-425 NMSN	285114625	Low-maint. pH comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL 99-120 Pt	285114630	Low-maintenance metal comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-225 Pt	285114635	Low-maintenance metal comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-325 Pt	285114640	Low-maintenance metal comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-360 Pt	285114645	Low-maintenance metal comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-425 Pt	285114650	Low-maintenance metal comb. electrode, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-120 NMSN	285114655	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP + T	0..14	-5..135	1..12
PL 99-225 NMSN	285114660	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP + T	0..14	-5..135	1..12
PL 99-325 NMSN	285114665	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP + T	0..14	-5..135	1..12
PL 99-360 NMSN	285114670	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP + T	0..14	-5..135	1..12
PL 99-425 NMSN	285114675	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, SILAMID® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP + T	0..14	-5..135	1..12
PL A-91-120 PETR VP	285114680	Low-maint. pH metal comb. Electrode with Pt1000, glass shaft, SILAMID® reference with silver ion trap, PTFE junction, RheoLid electrolyte with KCl rings, dome membrane, A glass, platinum disk, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+ORP+T	0..14	-5..110	1..12
PL A-91-225 PETR VP	285114685	Low-maint. pH metal comb. Electrode with Pt1000, glass shaft, SILAMID® reference with silver ion trap, PTFE junction, RheoLid electrolyte with KCl rings, dome membrane, A glass, platinum disk, VP screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+ORP+T	0..14	-5..110	1..12
PL A-91-325 PETR VP	285114690	Low-maint. pH metal comb. Electrode with Pt1000, glass shaft, SILAMID® reference with silver ion trap, PTFE junction, RheoLid electrolyte with KCl rings, dome membrane, A glass, platinum disk, VP screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+ORP+T	0..14	-5..110	1..12
PL A-91-360 PETR VP	285114695	Low-maint. pH metal comb. Electrode with Pt1000, glass shaft, SILAMID® reference with silver ion trap, PTFE junction, RheoLid electrolyte with KCl rings, dome membrane, A glass, platinum disk, VP screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+ORP+T	0..14	-5..110	1..12
PL A-91-425 PETR VP	285114700	Low-maint. pH metal comb. Electrode with Pt1000, glass shaft, SILAMID® reference with silver ion trap, PTFE junction, RheoLid electrolyte with KCl rings, dome membrane, A glass, platinum disk, VP screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+ORP+T	0..14	-5..110	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	PTFE	Rheolid	glass	12	325	NTC30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	360	NTC30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	425	NTC30	Memosens®
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	120		S8
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	225		S8
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	325		S8
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	360		S8
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	425		S8
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	120	NTC30	Memosens®
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	225	NTC30	Memosens®
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	325	NTC30	Memosens®
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	360	NTC30	Memosens®
platinum circle	n.a.	n.a.	PTFE	Rheolid	glass	12	425	NTC30	Memosens®
A+platinum disc	500	7	PTFE	Rheolid	glass	12	120	Pt1000	VP
A+platinum disc	500	7	PTFE	Rheolid	glass	12	225	Pt1000	VP
A+platinum disc	500	7	PTFE	Rheolid	glass	12	325	Pt1000	VP
A+platinum disc	500	7	PTFE	Rheolid	glass	12	360	Pt1000	VP
A+platinum disc	500	7	PTFE	Rheolid	glass	12	425	Pt1000	VP

## 2.3.3 Gel and Referid® electrodes

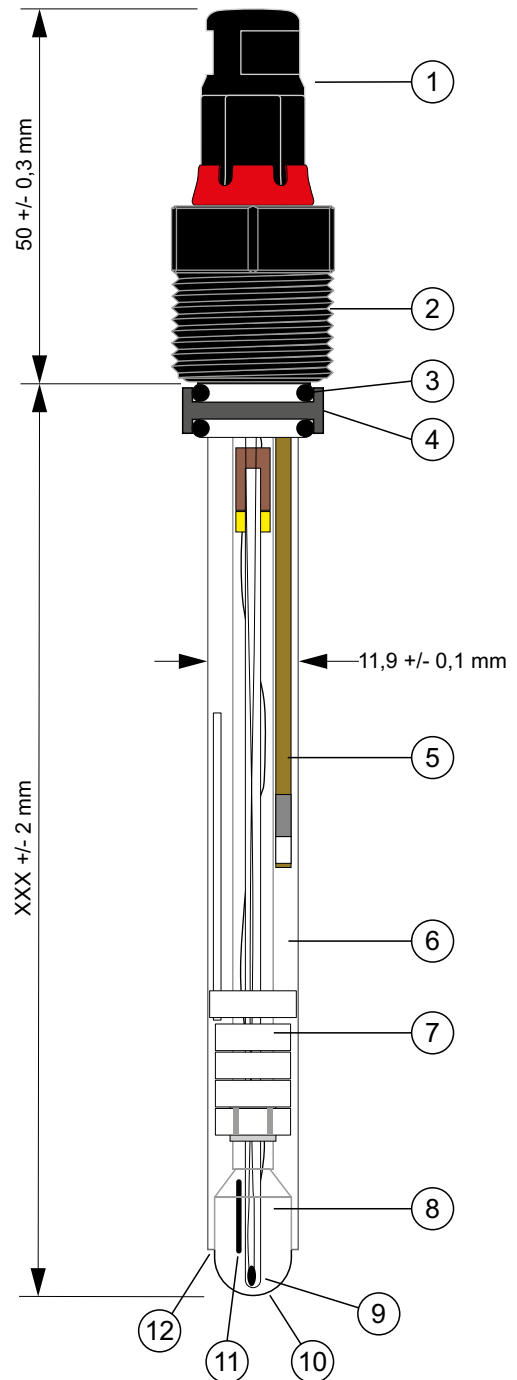
Gel and Referid® electrodes are suitable for measurement e.g. in chemical processes, dyes, detergents and many water applications.

With annular gap or ceramic junctions, gel or Referid electrolyte, these electrodes also meet the application requirements and feature high quality, reliability and a long sensor life.

### ATEX sensors in the SI Analytics program

You can select from a large range of process sensors as per the ATEX directive 94/9/EG. The approval of these ATEX sensors was conducted with PTB in Braunschweig and documented by means of the type examination certificate PTB 08ATEX2021. ATEX sensors are certified as per the device group II for zones 0 and 1 with gaseous atmospheres. They are classified as intrinsically safe as per spark protection type "ia" and can be used in the most common temperature classes.

### H8281-XXX NMSN

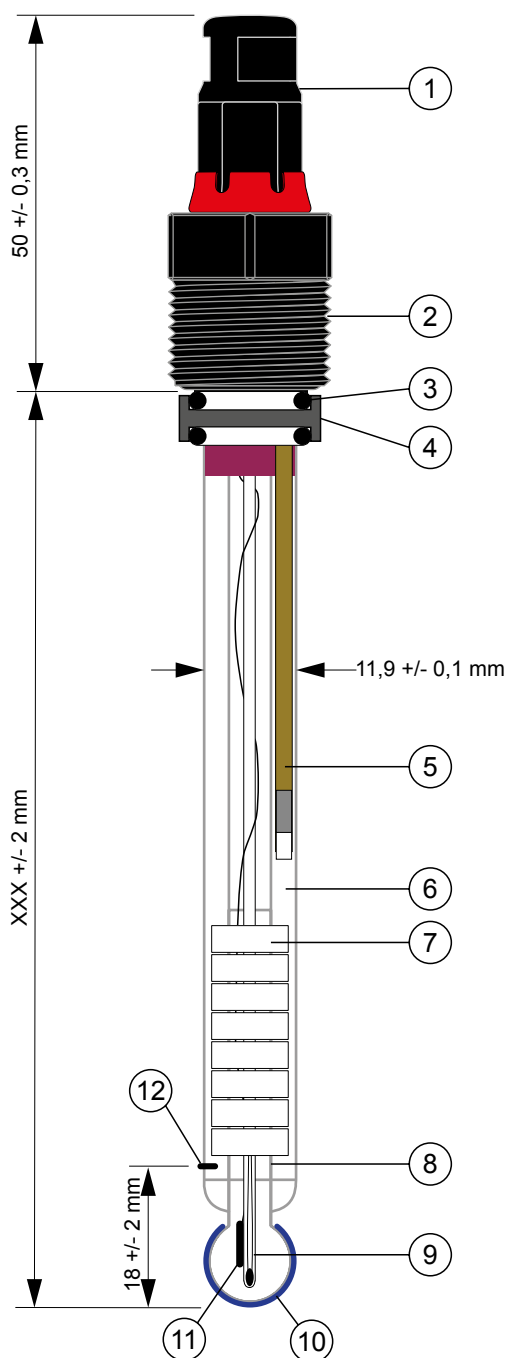


No.	Description H 8281 xxx NMSN
1	Screw plug head with Memosens® connection (Alternatively, analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton® )
4	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
5	Reference element (Silamid®)
6	Referid®-Polymerelectrolyte (KCl saturated) of the reference electrode
7	KCl storage tablets of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	Glass membrane (H glass)
11	Internal conduction element of the pH glass electrode
12	Junction (KPG® annular gap )



## Electrodes with Memosens® plug head

### A7781-xxx NMSN



Our Memosens® program contains pH and ORP electrodes. These sensors are compatible with all Memosens® transmitters and meters available on the market.

### What is the difference between Memosens® and other plug systems?

- Memosens® is a digital plug system.
- The sensor data is stored in the measuring head.
- The measuring signals are digitalized and transmitted inductively, i.e. contact-free.
- Absolutely waterproof and resistant against environmental influences.

### Which advantages does Memosens® offer?

- Memosens® is an open system, i.e. it is supported by different manufacturers.
- High process safety.
- Preventive maintenance.
- Perfect galvanized separation.

No.	Description A 7781 xxx NMSN
1	Screw plug head with Memosens® connection (Alternatively, analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
5	Reference element (Silamid®)
6	Gel electrolyte (KCl saturated) of the reference electrode
7	KCl storage tablets of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	Glass membrane (A glass)
11	Internal conduction element of the pH glass electrode
12	Junction (3 x ceramic)

#### Note:

All low maintenance Memosens® electrodes are approved as per the ATEX directive 94/9/EG. The testing took place at the EXAM in Bochum and was documented by means of the type examination certificate BVS 12 ATEX E 037 x.

# Gel and Referid® electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
A 7781 HD	285118130	Low maintenance, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, length 120 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH	0..14	-5..80	1..12
A 7781-225 HD	285114760	Low maintenance, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, length 225 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH	0..14	-5..80	1..12
A 7781-T1000 VP HD	285114790	Low maintenance with Pt 1000, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, VP screw plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH + T	0..14	-5..80	1..12
A7771T100VP	285114800	Low maintenance with Pt 100, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, VP screw plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH + T	0..14	-5..80	1..12
A7781-120 NMSN	285114765	Low maintenance pH combination electrode with NTC 30K, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH + T	0..14	-5..80	1..12
A7781-225 NMSN	285114770	Low maintenance pH combination electrode with NTC 30K, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH + T	0..14	-5..80	1..12
AgS 8281 HD	285118836	Low maintenance, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor silver pin 2 mm Ø, sulphidized, screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	ORP	n.a.	-5..100	1..12
H 7381 HD	285090077	Low maintenance, glass shaft, triple ceramic junction, gel electrolyte, Silamid®-reference system, cylinder membrane, H-glass, length 120 mm, 12 mm Ø, -5...+100 °C, 2...13 pH	pH	2..13	-5..100	1..12
H 7381-120 T1000 VP	285090155	Low maintenance, with temp.-sensor Pt 1000, glass shaft, triple ceramic junction, gel electrolyte, Silamid®-reference system, cylinder membrane, H-glass, VP screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C, 2...13 pH	pH + T	2..13	-5..100	1..12
H 7381-425 T1000 VP	285130215	Low maintenance, with temp.-sensor Pt 1000, glass shaft, triple ceramic junction, gel electrolyte, Silamid®-reference system, cylinder membrane, H-glass, VP screw plug head, length 425 mm, 12 mm Ø, -5...+100 °C, 2...13 pH	pH + T	2..13	-5..100	1..12
H 8181 HD	285111007	Low maintenance, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, plug head, length 170 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH	2..13	0..100	1..12
H 8281 HD	285111015	Low maintenance, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, plug head, length 120 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH	2..13	0..100	1..12
H 8281-120 T1000 VP	285094780	Low maintenance, with temperature sensor Pt 1000, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, VP plug head, length 120 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
A	200	7	3xceramic	gel	glass	12	120		S8
A	200	7	3xceramic	gel	glass	12	225		S8
A	200	7	3xceramic	gel	glass	12	120	Pt1000	VP
A	200	4.6	3xceramic	gel	glass	12	120	Pt100	VP
A	200	7	3xceramic	gel	glass	12	120	NTC30	Memosens®
A	200	7	3xceramic	gel	glass	12	225	NTC30	Memosens®
n.a.	n.a.	n.a.	KPG annular gap	Referid	glass	12	120		S8
H	300	7	3xceramic	gel	glass	12	120		S8
H	300	7	3xceramic	gel	glass	12	120	Pt1000	VP
H	300	7	3xceramic	gel	glass	12	425	Pt1000	VP
H	400	7	KPG annular gap	Referid	glass	12	170		S8
H	400	7	KPG annular gap	Referid	glass	12	120		S8
H	400	7	KPG annular gap	Referid	glass	12	120	Pt1000	VP

# Gel and Referid® electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
H 8281-120 NMSN	285111020	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12
H 8281-225 NMSN	285111040	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12
H 8281-325 NMSN	285111050	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12
H 8281-360 NMSN	285111030	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12
H 8281-425 NMSN	285111060	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH + T	2..13	0..100	1..12
H 8381 HD	285111023	Low maintenance, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, length 320 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH	2..13	0..100	1..12
H 8481 HD	285111072	Low maintenance, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, plug head, length 225 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH	2..13	0..100	1..12
L 7781 HD	285118088	Low maintenance, glass shaft, ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, length 120 mm, 12 mm Ø, -5...+80 °C, 2...12 pH	pH	2..12	-5..80	1..12
L 8281 HD	285111418	Low maintenance, glass shaft, KPG annular gap junction, Referid® electrolyte, Silamid® reference system, dome membrane, A-glass, plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 2...12 pH	pH	2..12	-5..80	1..12
Pt 7781 HD	285110754	Low maintenance, glass shaft, ceramic junction, gel electrolyte, Ag/AgCl-reference system, sensor platinum pin 1 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+60 °C	ORP	n.a.	-5..60	1..12
Pt 7781-225 HD	285108000	Low maintenance, glass shaft, ceramic junction, gel electrolyte, Ag/AgCl-reference system, sensor platinum pin 1 mm Ø, screw plug head, length 225 mm, 12 mm Ø, -5...+60 °C	ORP	n.a.	-5..60	1..12
Pt 8281 HD	285112414	Low maintenance ORP-combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 6 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	ORP	n.a.	-5..100	1..12
Pt 8281-120 NMSN	285111070	Low maintenance ORP-combination electrode with NTC 30K, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 6 mm Ø, Memosens® screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	ORP + T	n.a.	-5..100	1..12
Pt 8281-225 NMSN	285111110	Low maintenance ORP-combination electrode with NTC 30K, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 6 mm Ø, Memosens® screw plug head, length 225 mm, 12 mm Ø, -5...+100 °C	ORP + T	n.a.	-5..100	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	400	7	KPG annular gap	Referid	glass	12	120	NTC30	Memosens®
H	400	7	KPG annular gap	Referid	glass	12	225	NTC30	Memosens®
H	400	7	KPG annular gap	Referid	glass	12	325	NTC30	Memosens®
H	400	7	KPG annular gap	Referid	glass	12	360	NTC30	Memosens®
H	400	7	KPG annular gap	Referid	glass	12	425	NTC30	Memosens®
H	400	7	KPG annular gap	Referid	glass	12	360		S8
H	400	7	KPG annular gap	Referid	glass	12	225		S8
A	30	7	ceramic	gel	glass	12	120		S8
A	50	7	KPG annular gap	Referid	glass	12	120		S8
platinum rod	n.a.	n.a.	ceramic	gel	glass	12	120		S8
platinum rod	n.a.	n.a.	ceramic	gel	glass	12	225		S8
platinum circle	n.a.	n.a.	KPG annular gap	Referid	glass	12	120		S8
platinum circle	n.a.	n.a.	KPG annular gap	Referid	glass	12	120	NTC30	Memosens®
platinum circle	n.a.	n.a.	KPG annular gap	Referid	glass	12	225	NTC30	Memosens®



## 2.3.4 AquaLine - electrodes for measurement in water

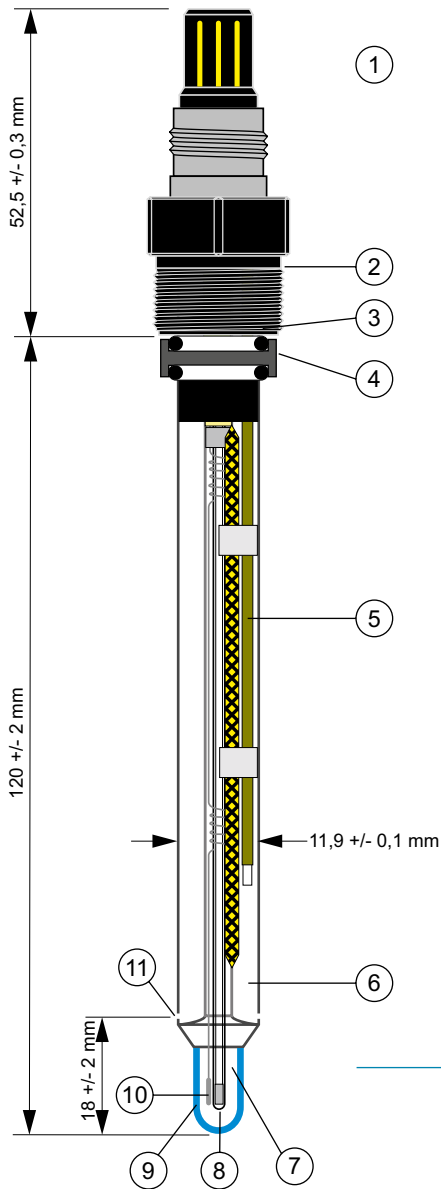
The AquaLine electrode series was developed specifically for water applications. pH electrodes with or without integrated temperature sensors as well as ORP electrodes cover the common applications in drinking water, plant water and wastewater.

With hole, annular gap or ceramic junctions, gel or Duralid electrolyte, these electrodes also meet the application requirements and feature high quality, reliability and a long sensor life.

The **AquaLine 50 and 51** are equipped with two hole junctions, i.e. an open connection with direct measuring medium contact. This design minimizes the risk of contamination/blocking of the junction, the main source of measuring errors, as well as the failure of the single rod measuring chain. The Duralid solid electrolyte, with high KCl content, reduces measurement interference due to diffusion potentials at the transition of the reference junctions to the measurement medium. The special features of the Duralid not only improve the life span and response of the electrode, but also allow for a stable measured value, even under the most adverse conditions, such as changing flow speeds.

No.	Description AL51 pHT VP
1	Screw plug head with VP-plug head
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®)
6	Duralid electrolyte (KCl saturated) of the reference electrode
7	Inner buffer of the pH glass electrode
8	Temperature sensor (NTC 30 kOhm)
9	Glass membrane (A-glass)
10	Internal conduction element of the pH glass electrode
11	Hole junction

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
AquaLine 50 pH	285113150	Low-maintenance pH combination electrode, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, cylinder membrane, A glass, screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...100 °C	pH	0..14	0..100	1..3
AquaLine 51 pHT VP	285113130	Low-maintenance pH combination electrode with Pt 1000, glass shaft, SILAMID® reference, 2 hole junction, DuraLid reference system, cylinder membrane, A glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...100 °C	pH+T	0..14	0..100	1..3
AquaLine 70 pH	285113049	pH combination electrode, glass shaft, ceramic junction, gel electrolyte, Silamid®-reference system, cone membrane, A-glass, plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 2...13 pH	pH	2..13	-5..80	1..3
AquaLine 79 Pt	285113073	ORP combination electrode, glass shaft, ceramic junction, gel electrolyte, Silamid®-reference system, sensor platinum disk 4 mm, plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 2...13 pH	ORP	2..13	-5..80	1..3
AquaLine 80 pH	285113098	pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, A-glass, plug head, length 120 mm, 12 mm Ø, 0...+80 °C, 2...13 pH	pH	2..13	0..80	1..10
AquaLine 89 Pt	285113143	ORP combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 4 mm, plug head, length 120 mm, 12 mm Ø, 0...+80 °C, 2...13 pH	ORP	2..13	0..80	1..10
AquaLine 90 pH	285113176	pH combination electrode, plastic shaft, fibre junction, gel electrolyte, Silamid®-reference system, cylinder membrane, A-glass, plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 2...13 pH	pH	2..13	-5..80	n.a.



AL51 pH T VP

- ▶ Long product life with low maintenance requirements in drinking water, plant water and wastewater.
- ▶ The high KCl content in all reference electrodes improves the product life span and response time, and also allows for a stable measured value.
- ▶ Very low risk of junction blockage in severely contaminated water with a hole or the symmetrical annular gap junction.
- ▶ All electrodes with integrated temperature sensor are supplied with a VP plug head. This plug system has proven itself over the years for industrial use.

Benefits  
at a glance

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
A	400	7	2 hole junctions	Duralid	glass	12	120	n.a.	S8
A	400	7	2 hole junctions	Duralid	glass	12	120	Pt1000	VP
A	200	7	ceramic	gel	glass	12	120	n.a.	S8
platinum circle	n.a.	n.a.	ceramic	gel	glass	12	120	n.a.	S8
A	300	7	KPG-annular gap	Referid	glass	12	120	n.a.	S8
platinum circle	n.a.	n.a.	KPG-annular gap	Referid	glass	12	120	n.a.	S8
A	400	7	fibre	gel	plastic	12	120	n.a.	S8

# 2.4.1 FlowLine electrodes with fluid potassium chloride feed

## pH and ORP single-rod measuring cells with KCl feed

In water and media with a very low conductivity in the low  $\mu\text{S}/\text{cm}$  range or with suspended solids, and extreme pH values, we recommend the use of pH electrodes with a liquid KCl reference electrolyte.

This electrolyte is emitted to the measuring medium via the junction. This reduces interference potential that cause measuring errors and also improves response time by increasing the conductivity in near the fields of the electrode. This method helps to keep the junction from becoming plugged and increases sensor life.

The electrodes of this series work reliably and accurately, even in demanding media, whether it be in the chemical industry, the food industry, biotechnology, incinerators, the paper industry, power plants or plastic chemistry.

In order for you to find the right electrode for your application, FlowLine electrodes are available with and without integrated temperature sensors as well as the following selections:

- **Three different process-proven membrane glasses:**
  - A-glass for media with low conductivity
  - H-glass for a large range of process applications and especially those with high alkalinity
  - S-glass with special resistance in highly alkaline applications and quick temperature changes
- **Two different electrolyte solutions:**
  - L200 for low temperature applications
  - L300 for general applications

- **Three different diaphragms** to select the electrolyte output that matches the respective application:

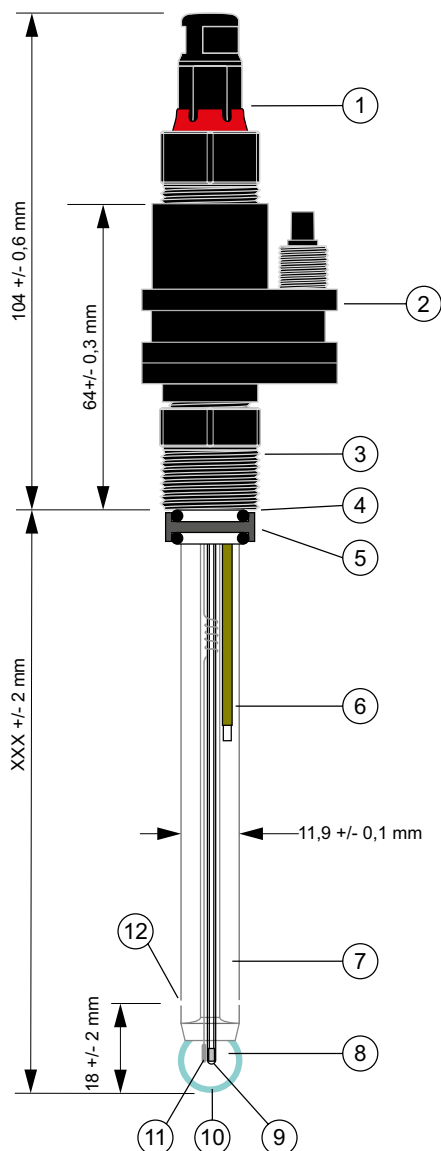
- Ceramic junction with an output of approx. 0.05 ml/h with a pressure application of 0.1 bar
- Platinum (MF) junction (MF = Multiflow) with an output of approx. 0.1 ml/h with a pressure application of 0.1 bar
- Ground joint (GJ) junction (GJ = Ground joint) with an output of approx. 2 ml/h with a pressure application of 0.1 bar

**A perfect allround solution for basically any application is the platinum junction.** Here, several platinum wires have been twisted and melted. The channels between the wires have constant dimensions. This ensures a pulsation-free output (compared to the ceramic junction) and therefore even more stable measured values and even better self-cleaning.



# Electrodes with Memosens® plug head

## FL 93-xxx NMSN



No.	Description FL 93-xxx
1	Screw plug head with Memosens® connection (Alternatively analogue electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Minature pressure adapter (MDA), material PPSU, with screw M10x1 for tube connection (ID 4 mm, OD 6 mm) to the electrolyte reservoir
3	Screw-in thread Pg 13.5 (material PPS)
4	O-Ring 11-2.5 (material Viton®)
5	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
6	Reference element (Silamid®)
7	Liquid electrolyte of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	glass membrane (depending on type of electrode A-, H- or S-glass)
11	Internal conduction element of the pH glass electrode
12	Junction (depending on the type of electrode ceramic, platinum or ground joint)

The Memosens® program of this electrode series includes pH and ORP electrodes. They are compatible with every meter on the market that is equipped with a Memosens® input.

### What is the difference between Memosens® and other plug systems?

- Memosens® is a digital plug system.
- The sensor data is stored in the measuring head.
- The measuring signals are digitalized and transmitted inductively, i.e. contact-free.
- Absolutely waterproof and resistant against environmental influences.

### Which advantages does Memosens® offer?

- Memosens® is an open system, i.e. it is supported by different manufacturers
- High process safety
- Preventive maintenance
- Perfect galvanized separation

- ▶ Refillable liquid electrolyte of the reference electrode.
- ▶ Highest possible measuring accuracy by reducing the junction interference potentials.
- ▶ Very quick response behavior.
- ▶ Matching electrode for every application by versatile selection of membrane glasses, liquid electrolyte, diaphragms as well as versions with and without temperature sensor and plug heads as analog and digital models.
- ▶ For Memosens®:
  - Highest possible process safety due to contact-free, inductive signal transmission
  - High comfort due to storage of sensor data in the sensor head

Benefits  
at a glance

# FlowLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
FLA 90-120 GJDiA pH	285110270	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ground joint junction, electrolyte L 200, sphere membrane, A-glass, coax screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH	0..14	-30..100	6/3
FLA 90-120 MF pH	285110260	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, coax screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH	0..14	-30..100	6/3
FLA 90-120 pH	285110250	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ceramic junction, electrolyte L 200, sphere membrane, A-glass, coax screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH	0..14	-30..100	6/3
FLA 90-280 MF pH	285110280	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, coax screw plug head, length 280 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH	0..14	-30..100	6/3
FLA 90-380 MF pH	285110290	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, coax screw plug head, length 380 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH	0..14	-30..100	6/3
FLA 91-120 MF VP pHHT	285110300	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 91-225 MF VP pHHT	285110310	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 225 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 91-280 MF VP pHHT	285110320	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 280 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 91-360 MF VP pHHT	285110330	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 360 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 91-380 MF VP pHHT	285110340	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 380 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 91-425 MF VP pHHT	285110350	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, VP screw plug head, length 425 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 93-120 MF NMSN	285118180	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 93-225 MF NMSN	285118185	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 93-280 MF NMSN	285118190	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 280 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FLA 93-380 MF NMSN	285118195	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 380 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FL H 90-120 GJDIA pH	285110380	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ground joint junction, electrolyte L 300, sphere membrane, H-glass, coax screw plug head, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
FL H 90-120 MF pH	285110370	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, coax screw plug head, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
A	200	7	ground joint	L200	glass	12	120		S8
A	200	7	platinum	L200	glass	12	120		S8
A	200	7	ceramic	L200	glass	12	120		S8
A	200	7	platinum	L200	glass	12	280		S8
A	200	7	platinum	L200	glass	12	380		S8
A	200	7	platinum	L200	glass	12	120	Pt1000	VP
A	200	7	platinum	L200	glass	12	225	Pt1000	VP
A	200	7	platinum	L200	glass	12	280	Pt1000	VP
A	200	7	platinum	L200	glass	12	360	Pt1000	VP
A	200	7	platinum	L200	glass	12	380	Pt1000	VP
A	200	7	platinum	L200	glass	12	425	Pt1000	VP
A	200	7	platinum	L200	glass	12	120	NTC30	Memosens®
A	200	7	platinum	L200	glass	12	225	NTC30	Memosens®
A	200	7	platinum	L200	glass	12	280	NTC30	Memosens®
A	200	7	platinum	L200	glass	12	380	NTC30	Memosens®
H	300	7	ground joint	L300	glass	12	120	-	S8
H	300	7	platinum	L300	glass	12	120	-	S8

# FlowLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [°C]	Pressure range [bar]
FL H 90-120 pH	285110360	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ceramic junction, electrolyte L 300, sphere membrane, H-glass, coax screw plug head, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
FL H 90-280 MF pH	285110390	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, coax screw plug head, length 280 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
FL H 90-380 MF pH	285110400	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, coax screw plug head, length 380 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
FL H 91-120 MF VP pH/T	285110410	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL H 91-225 MF VP pH/T	285110420	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 225 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL H 91-280 MF VP pH/T	285110430	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 280 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL H 91-360 MF VP pH/T	285110440	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 360 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL H 91-380 MF VP pH/T	285110450	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 380 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL H 91-425 MF VP pH/T	285110460	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, H-glass, VP screw plug head, length 425 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH+T	0..14	0..135	6/3
FL PT 90-120	285110610	Liquid electrolyte ORP comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ceramic junction, electrolyte L 300, Pt pin, coax screw plug head, length 120 mm, 12 mm Ø, -5...+135 °C, 0...14 pH	ORP	n.a.	-5..135	6/3
FL PT 90-225	285110620	Liquid electrolyte ORP comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ceramic junction, electrolyte L 300, Pt pin, coax screw plug head, length 225 mm, 12 mm Ø, -5...+135 °C, 0...14 pH	ORP	n.a.	-5..135	6/3
FL S 90-120 GJDIA pH	285110490	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ground joint junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-120 MF pH	285110480	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-120 pH	285110470	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, ceramic junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-225 MF pH	285110500	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 225 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3



Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	ceramic	L300	glass	12	120		S8
H	300	7	platinum	L300	glass	12	280		S8
H	300	7	platinum	L300	glass	12	380		S8
H	300	7	platinum	L300	glass	12	120	Pt1000	VP
H	300	7	platinum	L300	glass	12	225	Pt1000	VP
H	300	7	platinum	L300	glass	12	280	Pt1000	VP
H	300	7	platinum	L300	glass	12	360	Pt1000	VP
H	300	7	platinum	L300	glass	12	380	Pt1000	VP
H	300	7	platinum	L300	glass	12	425	Pt1000	VP
platinum rod	n.a.	n.a.	ceramic	L300	glass	12	120		S8
platinum rod	n.a.	n.a.	ceramic	L300	glass	12	225		S8
S	400	7	ground joint	L300	glass	12	120		S8
S	400	7	platinum	L300	glass	12	120		S8
S	400	7	ceramic	L300	glass	12	120		S8
S	400	7	platinum	L300	glass	12	225		S8

# FlowLine electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
FL S 90-280 MF pH	285110510	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 280 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-360 MF pH	285110520	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 360 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-380 MF pH	285110540	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 380 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 90-425 MF pH	285110530	Liquid electrolyte comb. electrode with integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, coax screw plug head, length 425 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	6/3
FL S 91-120 MF VP pH/T	285110550	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 91-225 MF VP pH/T	285110560	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 225 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 91-280 MF VP pH/T	285110570	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 280 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 91-360 MF VP pH/T	285110580	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 360 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 91-380 MF VP pH/T	285110590	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 380 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 91-425 MF VP pH/T	285110600	Liquid electrolyte comb. electrode with Pt 1000 and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, VP screw plug head, length 425 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-120 MF NMSN	285118200	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-225 MF NMSN	285118210	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-280 MF NMSN	285118220	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 280 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-380 MF NMSN	285118230	Liquid electrolyte comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 380 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
S	400	7	platinum	L300	glass	12	280		S8
S	400	7	platinum	L300	glass	12	360		S8
S	400	7	platinum	L300	glass	12	380		S8
S	400	7	platinum	L300	glass	12	425		S8
S	400	7	platinum	L300	glass	12	120	Pt1000	VP
S	400	7	platinum	L300	glass	12	225	Pt1000	VP
S	400	7	platinum	L300	glass	12	280	Pt1000	VP
S	400	7	platinum	L300	glass	12	360	Pt1000	VP
S	400	7	platinum	L300	glass	12	380	Pt1000	VP
S	400	7	platinum	L300	glass	12	425	Pt1000	VP
S	400	7	platinum	L300	glass	12	120	NTC30	Memosens®
S	400	7	platinum	L300	glass	12	225	NTC30	Memosens®
S	400	7	platinum	L300	glass	12	280	NTC30	Memosens®
S	400	7	platinum	L300	glass	12	380	NTC30	Memosens®

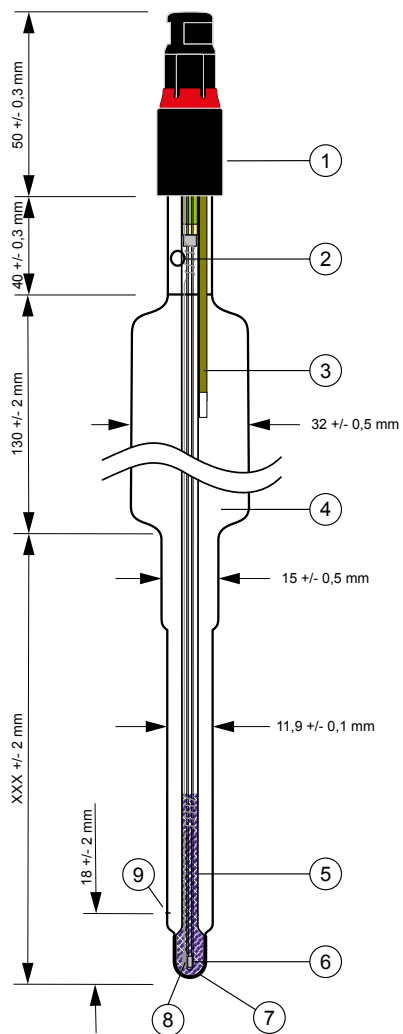
## 2.4.2 Electrodes with storage vessel

Even in critical biotech or pharmaceutical applications with the need to sterilize or autoclave them, electrodes with liquid electrolyte can have an advantage. This electrolyte is emitted to the measuring medium via the junction. This reduces interference potential that cause measuring errors and also improves response time by increasing the conductivity in near the fields of the electrode. This method helps to keep the junction from becoming plugged and increases sensor life.

- ▶ Refillable liquid electrolyte of the reference electrode with integrated storage container for demanding measurements in biotechnology and pharmaceutical industry.
- ▶ Highest possible measuring accuracy by reducing the junction interference potentials.
- ▶ Very quick response.
- ▶ For Memosens®:
  - Highest possible process safety due to contact-free, inductive signal transmission
  - Low maintenance due to storage of sensor data in the sensor head

Benefits  
at a glance

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
PET 26-308	285127627	pH-temp.-combination electrode, glass shaft, temp.-sensor Pt 1000, Silamid®-reference system, electrolyte L 310, 32/130 mm vessel, dome membrane, S-glass, VP plug head, length 308 mm, 12 mm Ø, 2...14 pH, 0...+135 °C	pH+T	2..14	0..135	6/3
Pt 22120	285128364	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 50 mm, Ag/AgCl-reference system, sensor platinum ring 6 mm Ø, length 120 mm, 12 mm Ø, 0...+135 °C	ORP	n.a.	0..135	6/3
S 22120	285128056	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 50 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 120 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 22200	285128072	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 50 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 200 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 23128	285128607	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 50 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 200 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 26120	285128348	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 130 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 120 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 26150	285128331	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 130 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 150 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 26200	285128356	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 130 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 200 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S 26250	285128989	Glass shaft, ceramic junction, electrolyte L 310, KCl vessel 130 mm, Ag/AgCl-reference system, cylinder membrane, S glass, length 250 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3
S26250 NMSN	285128350	Liquid electrolyte electrode with NTC 30K and KCl vessel 130 mm, Glass shaft, ceramic junction, electrolyte L 310, Ag/AgCl-reference system, cylinder membrane, S glass, length 250 mm, 12 mm Ø, 2...14 pH, +10...+135 °C	pH	2..14	10..135	6/3



No.	Description S 26 xxx NMSN
1	Screw plug head with Memosens® connection (Alternatively analogue electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Refilling hole
3	Reference element (Silamid®)
4	Liquid electrolyte of the reference electrode
5	Inner buffer of the pH glass electrode
6	Temperature sensor (NTC 30 kOhm)
7	Glass membrane (S-glass)
8	Internal conduction element of the pH glass electrode
9	Junction (ceramic)

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
S	900	7	hole	L310	glass	12	308	Pt1000	VP
platinum ring	n.a.	n.a.	ceramic	L310	glass	12	120		S7
S	600	7	ceramic	L310	glass	12	120		S7
S	600	7	ceramic	L310	glass	12	200		S7
S	600	7	ceramic	L310	glass	12	120		S7
S	600	7	ceramic	L310	glass	12	120		S7
S	600	7	ceramic	L310	glass	12	150		S7
S	600	7	ceramic	L310	glass	12	200		S7
S	600	7	ceramic	L310	glass	12	250		S7
S	600	7	ceramic	L310	glass	12	250	NTC30	Memosens®

## 2.4.3 Single-rod measuring cells with liquid electrolyte

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
Ag 9080	285110721	Glass shaft, ceramic junction, electrolyte KNO <sub>3</sub> 2 mol/l + KCl 0.001 mol/l, Ag/AgCl-reference system, refilling tube, sensor silver pin 2 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	6/3
AgS 6181 HD	285118811	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l thickened, Ag/AgCl-reference system, sensor silver pin 2 mm Ø, sulphidized, screw plug head, length 170 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	12
Au 9080	285110787	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, plug head, Ag/AgCl-reference system, refilling tube, sensor gold pin 2 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	6/3
Pt 6881	285111101	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sensor platinum ring 6 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	6/3
Pt 6981 HD	285111442	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sensor platinum ring 6 mm Ø, screw plug head, length 170 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	10/3
Pt 9080	285111089	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sensor platinum ring 6 mm Ø, refilling tube, plug head, length 120 mm, 12 mm Ø, -5...+100 °C	mV	n.a.	-5..100	6/3
9582/85	285118655	Glass shaft, 5 m fixed cable, Ag/AgCl-reference system, ceramic junction, sphere membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
9583/85	285118758	Glass shaft, 5 m fixed cable, Ag/AgCl-reference system, ground joint junction, sphere membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	6/3
H 6181 HD	285111426	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, plug head, length 170 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	12
H 6191 HD	285111434	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Silamid®-reference system, sphere membrane, H-glass, plug head, length 170 mm, 12 mm Ø, 0...+135 °C*, 0...14 pH	pH	0..14	0..135	12
H 6281	285110146	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 6291	285111964	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 6381	285110195	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, length 320 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 6391	285111923	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, length 320 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 6481	285110919	Glass shaft, ground joint-junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, H-glass, length 170 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 9080	285110795	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 9090	285110602	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
H 9180	285110951	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH.	pH	1..14	0..135	6/3
L 6191	285117967	Glass shaft, 3 x platinum junction, electrolyte L 200, Silamid® reference system, sphere membrane, A-glass, plug head, length 170 mm, 12 mm Ø, -30...+80 °C, 0...12 pH	pH	0..12	-30..80	6/3
L 9080	285118158	Glass shaft, 3 x ceramic junction, electrolyte L 200, Ag/AgCl-reference system, refilling tube, sphere membrane, A-glass, plug head, length 120 mm, 12 mm Ø, -3-5...+80 °C, 0...12 pH	pH	0..12	-30..80	6/3
L 9090	285118174	Glass shaft, platinum junction, electrolyte L 200, Ag/AgCl-reference system, refilling tube, sphere membrane, A-glass, plug head, length 120 mm, 12 mm Ø, -3-5...+80 °C, 0...12 pH	pH	0..12	-30..80	6/3
L 9180	285118166	Glass shaft, ground joint junction, electrolyte L 200, Ag/AgCl-reference system, refilling tube, sphere membrane, L-glass, plug head, length 120 mm, 12 mm Ø, -30...+80 °C, 0...12 pH	pH	0..12	-30..80	6/3
N 6681	285112352	Glass shaft, ground joint junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, N-glass, length 120 mm, 12 mm Ø, 0...+80 °C*, 0...14 pH	pH	0..14	0..80	6/3
S 6181 HD	285111972	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, sphere membrane, S-glass, length 170 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	10/3
S 9080	285112393	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	6/3
S 9090	285112422	Glass shaft, platinum junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	6/3
S 9180	285112406	Glass shaft, ground joint junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, plug head, sphere membrane, refilling tube, H-glass, length 120 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	6/3

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Connection head
silver pin	n.a.	n.a.	ceramic	KNO <sub>3</sub> 2mol/l + KCl 0.001 mol/l	glass	12	120	S7 + Pg 13.5 below refill olive
silver pin, sulfidized	n.a.	n.a.	ceramic	L300	glass	12	170	S8
gold pin	n.a.	n.a.	ceramic	L300	glass	12	120	S7 + Pg 13.5 below refill olive
platinum ring	n.a.	n.a.	ceramic	L300	glass	12	120	S8
platinum ring	n.a.	n.a.	ceramic	L300	glass	12	170	S8
platinum ring	n.a.	n.a.	ceramic	L300	glass	12	120	S7 + Pg 13.5 below refill olive
H	300	7	ceramic	L300	glass	12	120	5m fixed cable
H	300	7	ground joint	L300	glass	12	120	5m fixed cable
H	300	7	ceramic	L300	glass	12	170	S8
H	300	7	platinum	L300	glass	12	170	S8
H	300	7	ceramic	L300	glass	12	120	S8
H	300	7	platinum	L300	glass	12	120	S8
H	300	7	ceramic	L300	glass	12	320	S8
H	300	7	platinum	L300	glass	12	320	S8
H	300	7	ground joint	L300	glass	12	170	S8
H	300	7	ceramic	L300	glass	12	120	S7 + Pg 13.5 below refill olive
H	300	7	platinum	L300	glass	12	120	S7 + Pg 13.5 below refill olive
H	300	7	ground joint	L300	glass	12	120	S7 + Pg 13.5 below refill olive
A	200	7	3xplatinum	L200	glass	12	170	S8
A	200	7	3xceramics	L200	glass	12	120	S7 + Pg 13.5 below refill olive
A	200	7	platinum	L200	glass	12	120	S7 + Pg 13.5 below refill olive
L	30	7	ground joint	L200	glass	12	120	S7 + Pg 13.5 below refill olive
A	200	7	ground joint	L300	glass	12	120	S8
S	400	7	ceramic	L300	glass	12	170	S8
S	400	7	ceramic	L300	glass	12	120	S7 + Pg 13.5 below refill olive
S	400	7	platinum	L300	glass	12	120	S7 + Pg 13.5 below refill olive
S	400	7	ground joint	L300	glass	12	120	S7 + Pg 13.5 below refill olive



## 2.5.1 Glass, metal and reference electrodes electrolyte keys and resistance thermometers

### Separate measuring and reference electrodes

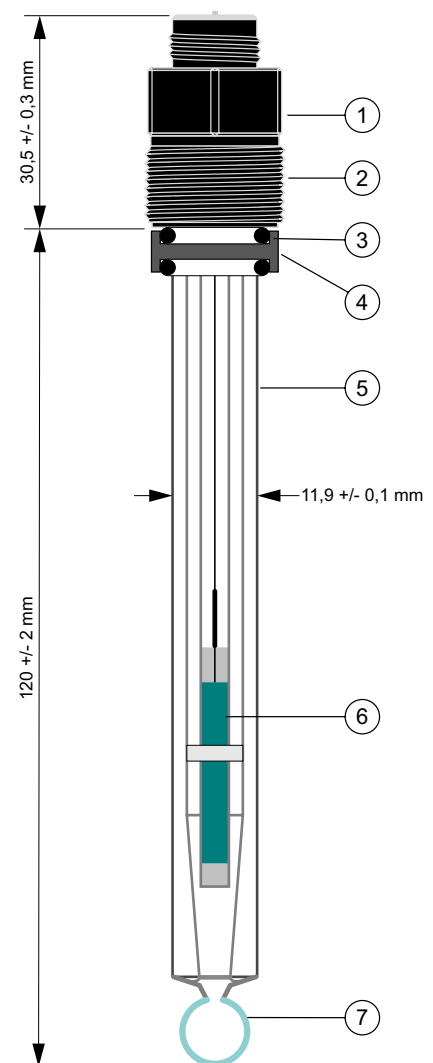
For demanding applications, such as media with...

- very low conductivity in the lower  $\mu\text{S}/\text{cm}$  range
- suspended materials or solids
- electrode toxins
- the most extreme pH values

...the use of separate electrodes is recommended.

Because the reference electrode has direct contact with the measuring medium, sensor reliability and life can be impacted. By separating the glass from the reference electrode you have the possibility of replacing only the sensor that has failed.

### S 1181 HD



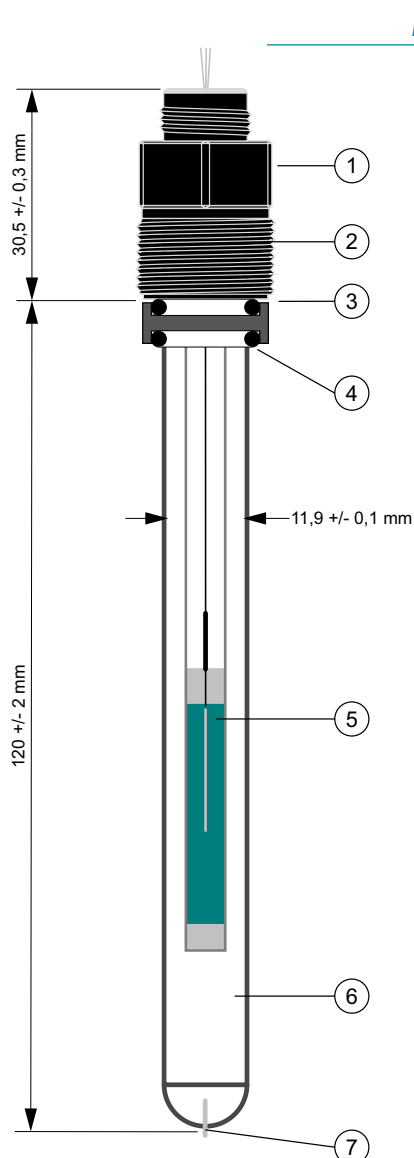
No.	Description S 1181 HD
1	Coax screw plug head
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
5	Shielding sheet
6	Internal conduction element of the pH glass electrode
7	Glass membrane

- ▶ Maximum measurement reliability and sensor life.
- ▶ By separating into glass and reference electrode, only the failed component needs to be replaced, if needed.
- ▶ Wide variety of options due to versatile combinations of glass and reference electrodes.
- ▶ By means of an electrolyte key, the reference electrode can be completely freed from the direct load by the medium.

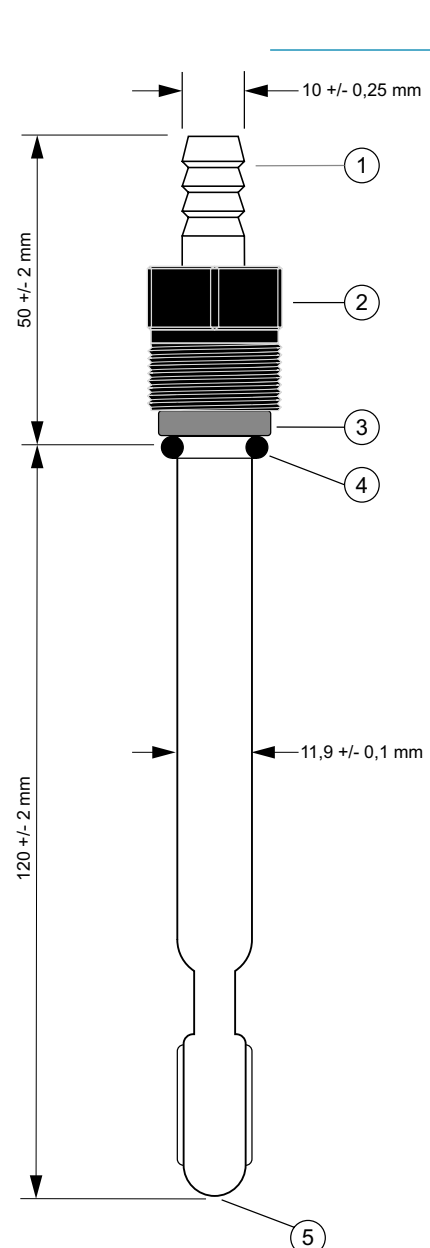
Benefits  
at a glance

With the measuring electrodes, that are also referred to as glass electrodes, you have a large selection of membrane glasses and their shape. The reference electrodes are available as low maintenance and liquid electrolyte filled models. The multitude of combination possibilities of these models will certainly let you find the match for your application.

The optimal solution for the pH measuring technology regarding measurement reliability and sensor life is indirect contact of the reference electrode with the medium. This refers to the location of the reference electrode in an electrolyte storage container which is conductively connected to the medium via an electrolyte key. The reference electrode is therefore in contact with the measuring medium without being exposed.



No.	Description B 1181 HD
1	Screw plug head for reference electrodes
2	Screw-in thread Pg 13.5 (material PPS)
3	O-Ring 11-2.5 (material Viton®)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element
6	Gel electrolyte (KCl saturated) of the reference electrode
7	Ceramic junction



No.	Description B 4411
1	Refilling port in form of a tube hose
2	Screw-in thread Pg 13.5 (material PPS)
3	Joint ring (material PVDF)
4	O-Ring 10-3.5 (material Viton®)
5	Ceramic junction

# Glass and metal electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
9008/15	285111356	Glass shaft, flange cap, 5 m fixed cable with free ends, sensor platinum ring, length 120 mm, 12 mm Ø, +0...+70 °C	ORP	n.a.	0..70	
9501/75	285114756	Glass shaft, flange cap, 5 m fixed cable, Ag/AgCl-reference system, sphere membrane, H-glass, zeropoint pH = 4.6, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	10
9501/85	285114859	Glass shaft, flange cap, 5 m fixed cable, Ag/AgCl-reference system, sphere membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+135 °C, 0...14 pH	pH	0..14	0..135	10
9517/85	285115255	Glass shaft, flange cap, 5 m fixed cable, Ag/AgCl-reference system, dome membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH	0..14	10..135	10
9701/85	285118955	Glass shaft, flange cap, 5 m fixed cable, Ag/AgCl-reference system, sphere membrane, L-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, -30...+80 °C, 0...14 pH	pH	0..12	-30..80	10
Ag 1101	285111048	PVDF shaft, sensor silver pin 2 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+70 °C	Ag ions	n.a.	-5..70	10
Au 1101	285111031	PVDF shaft, sensor gold pin 2 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+70 °C	ORP	n.a.	-5..70	10
H 1171 HD	285112114	Glass shaft, Ag/AgCl-reference system, sphere membrane, H-glass, zeropoint pH = 4.6, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH	pH	1..14	0..135	12
H 1181 HD	285111467	Glass shaft, Ag/AgCl-reference system, sphere membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH	pH	1..14	0..135	12
H 1191 HD	285111931	Glass shaft, Ag/AgCl-reference system, sphere membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+135 °C, 1...14 pH	pH	1..14	0..135	12
H 2781 HD	285111956	Glass shaft, Ag/AgCl-reference system, dome membrane, H-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, +10...+135 °C, 1...14 pH	pH	1..14	10..135	12
L 1181 HD	285111475	Glass shaft, Ag/AgCl-reference system, sphere membrane, A-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, -30...+80 °C, 0...12 pH	pH	0..12	-30..80	12
N 2981	285110208	Plastic shaft, Ag/AgCl-reference system, sphere membrane, N-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, 0...+80 °C, 0...14 pH	pH	0..14	0..80	10
Pt 1801 HD	285112233	Glass shaft, sensor platinum ring 6 mm Ø, length 120 mm, 12 mm Ø, -30...+135 °C	ORP	n.a.	-30..135	12
S 1181 HD	285111483	Glass shaft, Ag/AgCl-reference system, sphere membrane, S-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	12
S 2781 HD	285112093	Glass shaft, Ag/AgCl-reference system, dome membrane, S-glass, zeropoint pH = 7.0, length 120 mm, 12 mm Ø, +10...+135 °C, 2...14 pH	pH	2..14	10..135	12
Sb 1101	285111056	PVDF shaft, sensor antimony pin 6 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -5...+70 °C	pH in fluorid containing solutions	n.a.	-5..70	10
Wo 1101 HD	285097216	glass shaft, sensor wolfram pin 2 mm Ø, screw plug head, length 120 mm, 12 mm Ø, -30...+135 °C	ORP	n.a.	-30..135	12

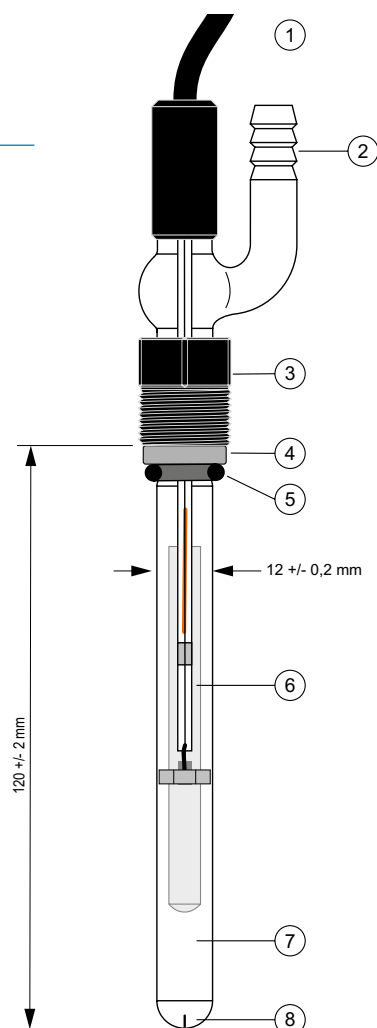
Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Shaft material	Shaft diameter [mm]	Length [mm]	Connection head
platinum ring	n.a.	n.a.	glass	12	120	fixed cable
H	300	4.6	glass	12	120	fixed cable
H	300	7	glass	12	120	fixed cable
H	500	7	glass	12	120	fixed cable
L	30	7	glass	12	120	fixed cable
silver pin	n.a.	n.a.	PVDF	12	120	S8
gold pin	n.a.	n.a.	PVDF	12	120	S8
H	300	4.6	glass	12	120	S8
H	300	7	glass	12	120	S8
H	2000	7	glass	12	120	S8
H	500	7	glass	12	120	S8
A	300	7	glass	12	120	S8
N	100	7	plastic	12	120	S8
platinum ring	n.a.	n.a.	glass	12	120	S8
S	400	7	glass	12	120	S8
S	600	7	glass	12	120	S8
Sb pin	n.a.	n.a.	PVDF	12	120	S8
Wo pin	n.a.	n.a.	glass	12	120	S8

# Reference electrodes

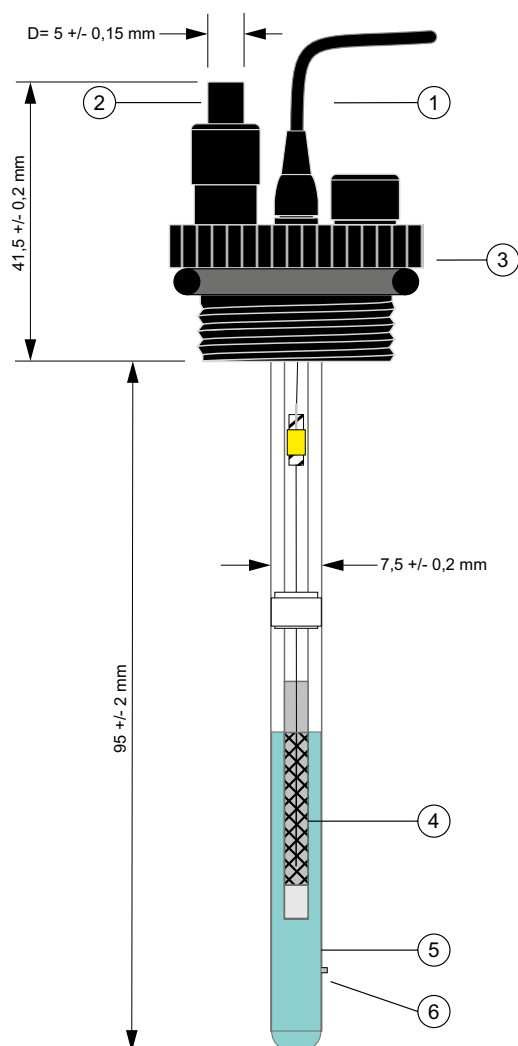
Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C ]	Pressure range [bar]
9801/85	285117856	Low maintenance, glass shaft, ceramic junction, paste electrolyte, Ag/AgCl-reference system, flange cap, 5 m fixed cable, length 120 mm, 12 mm Ø, -5...+50 °C	reference potential	n.a.	-5..50	0,5
9828/95	285116851	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, refilling tube, 5 m fixed cable, length 120 mm, 12 mm Ø, +5...+135 °C	reference potential	n.a.	-5..135	6/3
9871/95	285117556	Glass shaft, ceramic junction, electrolyte KCl 3 mol/l, Ag/AgCl-reference system, PPS fitting head, 5 m fixed cable, length 95 mm, -5...+135 °C	reference potential	n.a.	-5..135	3
B 1181 HD	285111701	Low maintenance, glass shaft, Ag/AgCl-reference system, ceramic junction, paste electrolyte, length 120 mm, 12 mm Ø, -5...+50 °C	reference potential	n.a.	-5..50	12
B 1391 HD	285111491	Glass shaft, Ag/AgCl-reference system, platinum junction, electrolyte KCl 3 mol/l, length 170 mm, 12 mm Ø, +5...+135 °C	reference potential	n.a.	-5..135	12
B 1491 HD	285111504	Glass shaft, Ag/AgCl-reference system, ceramic junction, electrolyte KCl 3 mol/l, length 170 mm, 12 mm Ø, +5...+135 °C	reference potential	n.a.	-5..135	12
B 1881 HD	285111767	Low maintenance, PVDF shaft, Ag/AgCl-reference system, PVDF junction, paste electrolyte, length 120 mm, 12 mm Ø, -5...+100 °C	reference potential	n.a.	-5..100	12
B 1981 HD	285111915	Low maintenance, glass shaft, Silamid® reference system, KPG annular gap junction, Referid®-electrolyte, length 120 mm, 12 mm Ø, -5...+100 °C	reference potential	n.a.	-5..100	12

## 9828/95

No.	Description 9828/95
1	Fixed cable with 5 m length and loose end
2	Refilling port in form of a tube hose
3	Shaft constriction with screw-in thread Pg 13.5 (material PPS)
4	Joint ring (material PVDF)
5	O-Ring 10-4 (material Viton®)
6	Reference element
7	Liquid electrolyte (KCl 3 mol/l) of the reference electrode
8	Ceramic junction



Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Shaft material	Shaft diameter [mm]	Length [mm]	Connection head
n.a.	ceramic	Gel	glass	12	120	fixed cable
n.a.	ceramic	L300	glass	12	120	fixed cable
n.a.	ceramic	n.a	glass	12	95	fixed cable
n.a.	ceramic	Gel	glass	12	120	reference electrode old design bunch pin plug
n.a.	platinum	L300	glass	12	170	reference electrode old design bunch pin plug
n.a.	ceramic	L300	glass	12	170	reference electrode old design bunch pin plug
n.a.	PVDF	Gel	PVDF	12	120	reference electrode old design bunch pin plug
n.a.	KPG annular gap	Referid	glass	12	120	reference electrode old design bunch pin plug



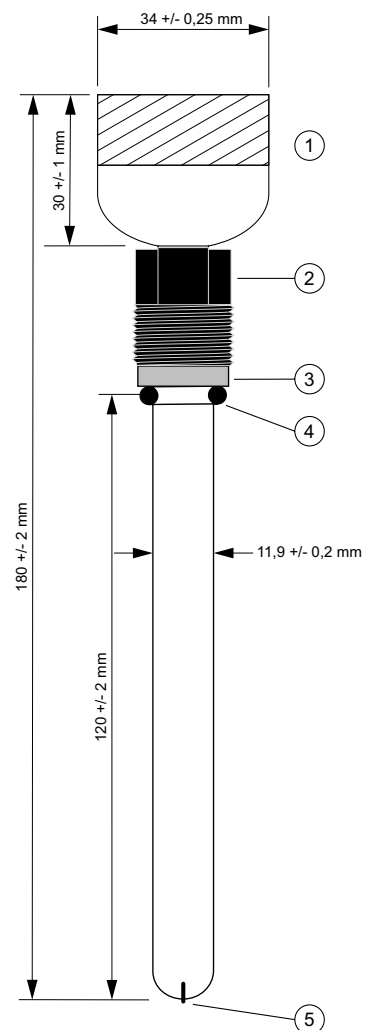
9871/95

No.	Description 9871/95
1	Fixed cable with 5 m length and loose end
2	Refilling port with tube connection
3	Screw Head for detachable reference electrodes (material PPS)
4	Reference element
5	Liquid electrolyte (KCl 3 mol/l) of the reference electrode
6	Ceramic junction

# Electrolyte vessels and keys

Type No.	Order number	Description	Temperature range [ °C]
9844/01	285118006	Glass shaft, ceramic junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
9844/02	285118014	Glass shaft, platinum junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
9844/03	285118022	Glass shaft, triple ceramic junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
9844/05	285118047	Glass shaft, frit junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
9844/07	285118055	Glass shaft, platinum junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
9844/11	285118109	Glass shaft, ceramic junction, flange cap, length 120 mm, -5...+135 °C	-5..135
9844/14	285118117	Glass shaft, ground joint junction, flange cap, length 120 mm, -5...+135 °C	-5..135
9844/26	285118199	PVDF shaft, ceramic junction, flange cap, length 120 mm, -5...+135 °C	-5..135
B 4411	285118203	Glass shaft, ceramic junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
B 4441	285118211	Glass shaft, ground joint junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
B 4451	285118228	Glass shaft, glass frit junction, screwing PG 13.5, length 120 mm, -30...+135 °C	-30..135
B 4471	285118236	Glass shaft, platinum junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135
B 4491	285118244	PTFE-shaft, PTFE-junction, screwing PG 13.5, length 120 mm, -5...+135 °C	-5..135

9863/01



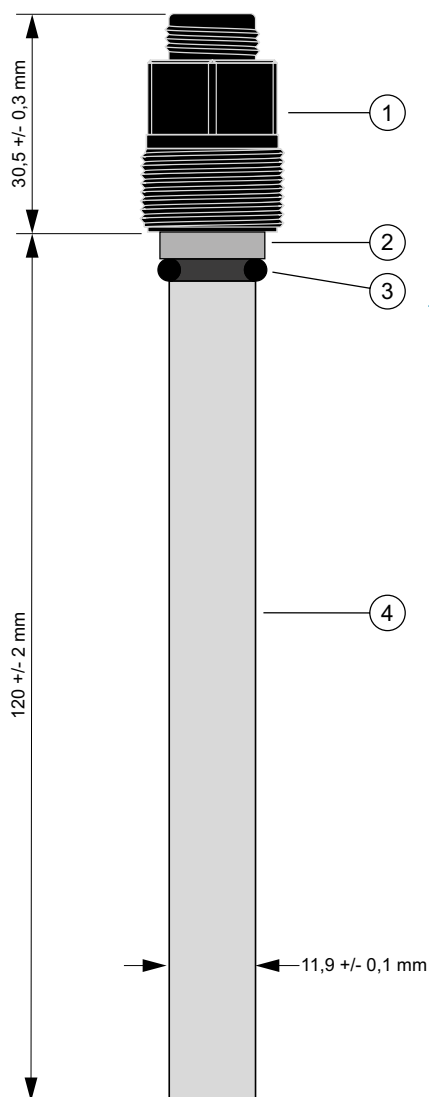


Pressure range [bar]	Junction	Shaft material	Shaft diameter [mm]	Length [mm]
6/3	ceramic	glass	12	120
6/3	platinum	glass	12	120
6/3	3xceramics	glass	12	120
6/3	Fritte	glass	12	120
6/3	platinum	glass	12	120
6/3	ceramic	glass	12	120
6/3	ground joint	glass	12	120
6/3	ceramic	PVDF	12	120
6/3	ceramic	glass	12	120
6/3	ground joint	glass	12	120
6/3	frit	glass	12	120
6/3	platinum	glass	12	120
2/2	PTFE	PTFE	12	120

No.	Description 9863/01
1	Storage vessel
2	Shaft constriction with screw-in thread Pg 13.5 (material PPS)
3	Joint ring (material PVDF)
4	O-Ring 10-4 (material Viton® )
5	Ceramic junction

# Resistance thermometers (RTDs) and ground electrodes

Type No.	Order number	Description	pH range	Temperature range [ °C]	Pressure range [bar]
9010/85	285111759	Glass shaft, flange cap, 5 m fixed cable with free end, sensor Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
E 1651	285119754	Stainless steel shaft (1.4571), length 120 mm, 12 mm Ø, -5...+135 °C	T	-5..135	10
W 2021	285119113	Stainless steel shaft (1.4571), sensor Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 2041	285119068	Glass shaft, sensor Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 2081	285119162	Glass shaft, sensor Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 2121	285119187	Stainless steel shaft (1.4571), sensor Pt 1000, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 2161	285119208	Glass shaft, sensor Pt 1000 + secondary platinum electrode, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 4011	285119619	PVDF shaft, sensor Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10
W 4081	285119627	Glass shaft, sensor 2 x Pt 100, length 120 mm, 12 mm Ø, -30...+135 °C	T	-30..135	10



W2021

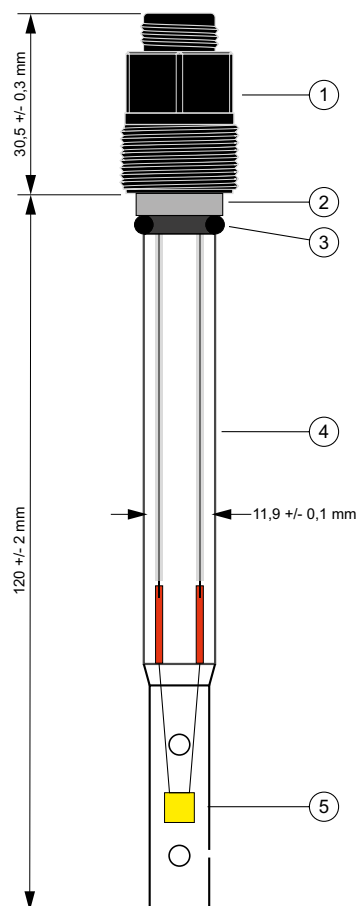
Membrane glass or sensor	Shaft material	Shaft diameter [mm]	Length [mm]	Connection head
Pt100	glass	12	120	fixed cable
n.a.	stainless steel	12	120	bunch pin plug
Pt100	stainless steel	12	120	2 pole
Pt100	glass	12	120	2 pole
Pt100	glass	12	120	2 pole
Pt1000	stainless steel	12	120	2 pole
Pt1000	glass	12	120	4 pole
Pt100	PVDF	12	120	2 pole
2 x Pt100	glass	12	120	4 pole

No.	Description W2021
1	Screw plug head with screw-in thread Pg 13.5 (material PPS)
2	Joint ring (material PVDF)
3	O-Ring 10-3.5 (material Viton®)
4	Shaft made of stainless steel

## 2.5.2 Conductivity and oxygen measuring cells

Type No.	Order number	Description	Parameter	Temperature range [ °C ]	Pressure range [ bar ]
NH 1101	1064386	Plastic shaft, exchangable membrane modul, measuring range 0.1 mg/l...1000 mg/l, 0...+50 °C, screw plug head, length 120 mm, 12 mm Ø	Ammonium	0..50	
Cond 5101	285119849	2 pole cell, plastic shaft, sensor 2 platinum rings, cell constant 1.0 cm-1, length 120 mm, 12 mm Ø, 0...+80 °C	Cond	0..80	10
Cond 1101	285119816	2 pole cell, glass shaft, sensor 2 platinum plates, cell constant 1.0 cm-1, length 120 mm, 12 mm Ø, -30...+100 °C	Cond	-30..100	10
Cond 5101 T	285119857	2 pole cell, plastic shaft, sensor 2 platinum rings, cell constant 1.0 cm-1, temp.-sensor Pt 1000, length 120 mm, 12 mm Ø, 0...+80 °C	Cond	0..80	10
Cond 1051	285119808	2 pole cell, glass shaft, sensor 2 platinum plates, cell constant 0.5 cm-1, length 120 mm, 12 mm Ø, -30...+100 °C	Cond	-30..100	10
Cond 1101 T	285119832	2 pole cell, glass shaft, sensor 2 platinum plates, cell constant 1.0 cm-1, temp.-sensor Pt 1000, length 120 mm, 12 mm Ø, -30...+100 °C	Cond	-30..100	10
OX 1101	285119705	Membrane covered amperometric sensor, plastic shaft, cathode platinum, anode silver, temperature sensor NTC 100 kW, 4-pole plug head, length 120 mm, 12 mm Ø, 0...+50 °C, i.e. for oxygen meter CG 867	oxygen	0..50	n.a.
9009/22	285111623	Membrane covered amperometric sensor, plastic shaft, cathode platinum, anode silver, temperature sensor NTC 100 kOhm, flange cap, 2 m fixed cable with free ends, length 120 mm, 12 mm Ø, 0...+50 °C, i.e. for oxygen meter CG 867	oxygen	0..50	n.a.
LF71T1X	285119720	4 pole cell, glass shaft, Pg13.5 thread, 1 m fixed cable with free end, sensor 4 platinum rings, cell constant 1.0 cm-1, temp.-sensor Pt 1000, length 120 mm, 12 mm Ø, -30...+100 °C	Cond	-30..100	10
Cond 4TH 60-120	285126725	4 pole cell, glass shaft, sensor 4 platinum rings, secondary platinum electrode, temp.-sensor Pt 1000, VP plug head, length 120 mm, 12 mm Ø, -5...+80 °C	Cond	-5..80	6

Cond 1101



Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
L6408 NH4 electrolyte	POM	12	120		S8
n.a.	plastic	12	120		S8
n.a.	glass	12	120		4 pole
n.a.	plastic	12	120	Pt1000	2 pole
n.a.	glass	12	120		2 pole
n.a.	glass	12	120	Pt1000	4 pole
oxygen electrolyte L6708	POM	12	120	NTC100	4 pole
oxygen electrolyte L6708	POM	12	120	NTC100	fixed cable, open end, 2m
n.a.	glass	12	120	Pt1000	fixed cable, open end, 1m
n.a.	glass	12	120	Pt1000	VP

No.	Description Cond 1101
1	Screw plug head with screw-in thread Pg 13.5 (material PPS)
2	Joint ring (material PVDF)
3	O-Ring 10-3.5 (material Viton® )
4	Shaft made of glass
5	Sensors made of platinum

## 2.6 Electrodes with Memosens®-plug head

Our Memosens® program includes pH electrodes and ORP electrodes. They are compatible with every meter and transmitter on the market that is equipped with a Memosens® input.

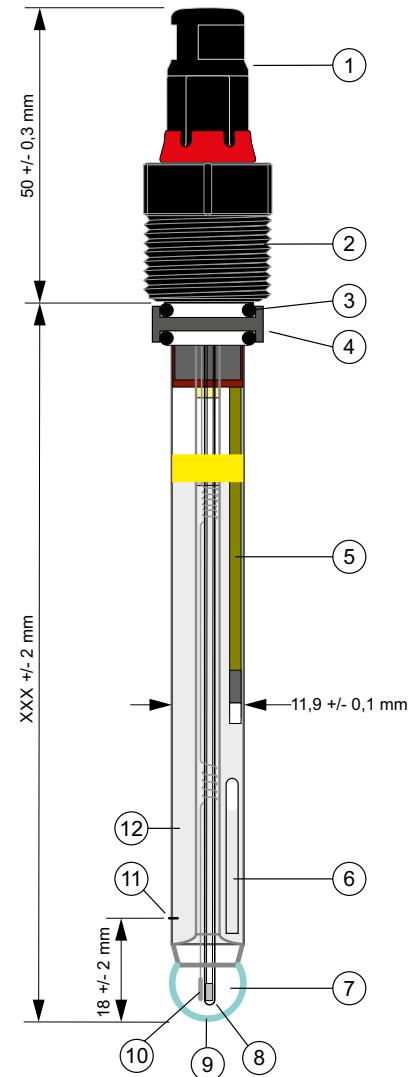
In addition to the proven analog electrodes of the ProcessLine or SteamLine product family, our Memosens® electrode lineup also includes the new FlowLine series. These are liquid electrolyte electrodes with integrated plastic miniature pressure adapter for connection via a hose to an electrolyte storage vessel. An NTC 30 K temperature sensor is used with all Memosens electrodes.

### What is the difference between Memosens® and other connection systems?

Memosens® is a digital connection system

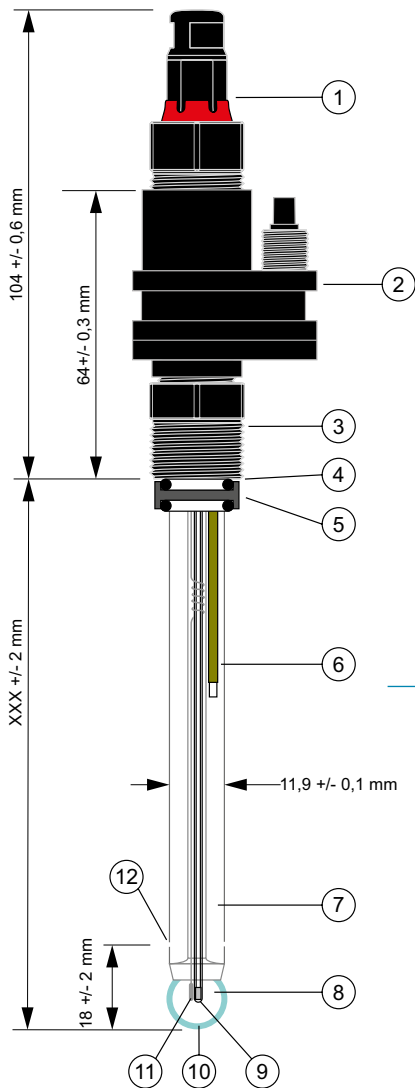
- The sensor data is stored in the measuring head.
- Inductive signal transmission without metal contacts
- They are absolutely waterproof and resistant against environmental influences

### SL 83-xxx NMSN



No.	Description SL 83-xxx
1	Screw plug head with Memosens® connection (alternatively analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Screw-in thread Pg 13.5 (material PPS)
3	O-ring 11-2.5 (material EPDM)
4	HD joint ring 18.8/12.7/6.5 (material stainless steel 1.4571)
5	Reference element (Silamid®) with silver ion trap
6	Manometer for the pressurization of the reference electrode
7	Inner buffer of the pH glass electrode
8	Temperature sensor (NTC 30 kOhm)
9	Glass membrane (S-glass)
10	Internal conduction element of the pH glass electrode
11	Junction (ceramic)
12	Pressurized Rheolid®-gel electrolyte (KCl saturated) of the reference electrode

All low maintenance Memosens® electrodes are approved as per the ATEX directive 94/9/EG. The testing took place at the EXAM in Bochum and was documented by means of the type examination certificate BVS 12 ATEX E 037 x.



### What advantages does Memosens® offer?

- Corrosion-free plug connection
- Plug connection can even be connected under water without influencing the measured value
- Preventative maintenance with access to current and past sensor data
- Automatic error messages in case of sensor failures or disruption of the connection between the sensor and the transmitter
- No mandatory calibration of the sensor at the measuring point. Instead, you can conveniently and safely calibrate them in the lab under optimal conditions
- Perfect galvanic separation

➔ **Highest possible process and measurement accuracy**

*FL 93-xxx NMSN*

No.	Description FL 93-xxx
1	Screw plug head with Memosens® connection (Alternatively analog electrodes with VP or coax plug head (for versions without integrated temperature sensor))
2	Miniature pressure adapter (MDA), material PPSU, with screw M10x1 for tube connection (ID 4 mm, OD 6 mm) to the electrolyte reservoir
3	Screw-in thread Pg 13.5 (material PPS)
4	O-Ring 11-2.5 (material Viton®)
5	HD joint ring 18.8/12.7/6.5 (Material stainless steel 1.4571)
6	Reference element (Silamid®)
7	Liquid electrolyte of the reference electrode
8	Inner buffer of the pH glass electrode
9	Temperature sensor (NTC 30 kOhm)
10	Glass membrane (depending on type of electrode A-, H- or S-glass)
11	Internal conduction element of the pH glass electrode
12	Junction (depending on the type of electrode ceramic, platinum or ground joint)

- Electrodes for any application due to a wide variety of membrane glasses, electrolyte, junctions, temperature sensors, and connection plugs. Both analog and digital options are available.
- Highest possible process safety due to contact-free, inductive signal transmission.
- High comfort due to storage of sensor data in the sensor head

Benefits  
at a glance



# Memosens® electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
A7781-120 NMSN	285114765	Low maintenance pH combination electrode with NTC 30K, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH+T	0..14	-5..80	1..12
A7781-225 NMSN	285114770	Low maintenance pH combination electrode with NTC 30K, glass shaft, 3 x ceramic junction, gel electrolyte, Silamid®-reference system, sphere membrane, A-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, -5...+80 °C, 0...14 pH	pH+T	0..14	-5..80	1..12
FL A 93-120 MF NMSN	285118180	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FL A 93-225 MF NMSN	285118185	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FL A 93-280 MF NMSN	285118190	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 280 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FL A 93-380 MF NMSN	285118195	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 200, sphere membrane, A-glass, Memosens® screw plug head, length 380 mm, 12 mm Ø, -30...+100 °C, 0...14 pH	pH+T	0..14	-30..100	6/3
FL S 93-120 MF NMSN	285118200	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-225 MF NMSN	285118210	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-280 MF NMSN	285118220	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 280 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
FL S 93-380 MF NMSN	285118230	Liquid electrolyt comb. electrode with NTC 30K and integrated plastic adapter for hose connection incl. Pg13.5 thread, platinum junction, electrolyte L 300, sphere membrane, S-glass, Memosens® screw plug head, length 380 mm, 12 mm Ø, +10...+135 °C, 0...14 pH	pH+T	0..14	10..135	6/3
H 8281-120 NMSN	285111020	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH+T	2..13	0..100	1..12
H 8281-225 NMSN	285111040	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH+T	2..13	0..100	1..12
H 8281-325 NMSN	285111050	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH+T	2..13	0..100	1..12
H 8281-360 NMSN	285111030	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH+T	2..13	0..100	1..12
H 8281-425 NMSN	285111060	Low maintenance pH combination electrode, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, dome membrane, H-glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...+100 °C, 2...13 pH	pH+T	2..13	0..100	1..12
PL 83-120 NMSN	285113495	Low-maintenance pH combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH+T	0..14	0..130	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
A	200	7	ceramic	Gel	glass	12	120	NTC 30	Memosens®
A	200	7	ceramic	Gel	glass	12	225	NTC 30	Memosens®
A	200	7	platinum	L200	glass	12	120	NTC 30	Memosens®
A	200	7	platinum	L200	glass	12	225	NTC 30	Memosens®
A	200	7	platinum	L200	glass	12	280	NTC 30	Memosens®
A	200	7	platinum	L200	glass	12	380	NTC 30	Memosens®
S	400	7	platinum	L300	glass	12	120	NTC 30	Memosens®
S	400	7	platinum	L300	glass	12	225	NTC 30	Memosens®
S	400	7	platinum	L300	glass	12	280	NTC 30	Memosens®
S	400	7	platinum	L300	glass	12	380	NTC 30	Memosens®
H	400	7	KPG annular gap	Referid®	glass	12	120	NTC 30	Memosens®
H	400	7	KPG annular gap	Referid®	glass	12	225	NTC 30	Memosens®
H	400	7	KPG annular gap	Referid®	glass	12	325	NTC 30	Memosens®
H	400	7	KPG annular gap	Referid®	glass	12	360	NTC 30	Memosens®
H	400	7	KPG annular gap	Referid®	glass	12	425	NTC 30	Memosens®
H	300	7	2 hole junctions	Duralid	glass	12	120	NTC 30	Memosens®

# Memosens® electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
PL 83-225 NMSN	285113505	Low-maintenance pH combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH+T	0..14	0..130	1..12
PL 83-325 NMSN	285113515	Low-maintenance pH combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH+T	0..14	0..130	1..12
PL 83-360 NMSN	285113525	Low-maintenance pH combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH+T	0..14	0..130	1..12
PL 83-425 NMSN	285113535	Low-maintenance pH combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sphere membrane, H glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...130 °C	pH+T	0..14	0..130	1..12
PL 89-120 NMSN	285113565	Low-maintenance metal combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
PL 89-225 NMSN	285113575	Low-maintenance metal combination electrode with NTC 30K, glass shaft, Silamid® reference, 2 hole junction, DuraLid reference system, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...130 °C	ORP	n.a.	0..130	1..12
Pt 8281-120 NMSN	285111070	Low maintenance ORP-combination electrode with NTC 30K, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 6 mm Ø, Memosens® screw plug head, length 120 mm, 12 mm Ø, -5...+100 °C	ORP	n.a.	-5..100	1..12
Pt 8281-225 NMSN	285111110	Low maintenance ORP-combination electrode with NTC 30K, glass shaft, KPG annular gap junction, Referid®-electrolyte, Silamid®-reference system, sensor platinum disk 6 mm Ø, Memosens® screw plug head, length 225 mm, 12 mm Ø, -5...+100 °C	ORP	n.a.	-5..100	1..12
S26250 NMSN	285128350	Liquid electrolyte electrode with NTC 30K and KCl vessel 130 mm, Glass shaft, ceramic junction, electrolyte L 310, Ag/AgCl-reference system, cylinder membrane, S glass, length 250 mm, 12 mm Ø, 0...14 pH, +10...+135 °C	pH+T	0..14	10..135	1..12
SL 83-120 NMSN	285114025	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-225 NMSN	285114035	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-325 NMSN	285114045	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-360 NMSN	285114055	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 83-425 NMSN	285114065	Low-maint. pH comb. electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junct., press. RheoLid ref. system, sphere membrane, S glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...140 °C	pH+T	0..14	0..140	1..12
SL 89-120 NMSN	285114075	Low-maintenance metal comb. Electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
SL 89-225 NMSN	285114085	Low-maintenance metal comb. Electrode with NTC 30K, hot steam sterilizable, CIP and SIP able, glass shaft, Silamid® ref., ceramic junction, press. RheoLid ref. system, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...140 °C	ORP	n.a.	0..140	1..12
PL A-93-120 NMSN	285114580	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
H	300	7	2 hole junctions	Duralid	glass	12	225	NTC 30	Memosens®
H	300	7	2 hole junctions	Duralid	glass	12	325	NTC 30	Memosens®
H	300	7	2 hole junctions	Duralid	glass	12	360	NTC 30	Memosens®
H	300	7	2 hole junctions	Duralid	glass	12	425	NTC 30	Memosens®
platinum disc	n.a.	n.a.	2 hole junctions	Duralid	glass	12	120	NTC 30	Memosens®
platinum disc	n.a.	n.a.	2 hole junctions	Duralid	glass	12	225	NTC 30	Memosens®
platinum circle	n.a.	n.a.	KPG annular gap	Referid®	glass	12	120	NTC 30	Memosens®
platinum circle	n.a.	n.a.	KPG annular gap	Referid®	glass	12	225	NTC 30	Memosens®
S	600	7	ceramic	L310	glass	12	250	NTC 30	Memosens®
S	400	7	ceramic	Rheolid	glass	12	120	NTC 30	Memosens®
S	400	7	ceramic	Rheolid	glass	12	225	NTC 30	Memosens®
S	400	7	ceramic	Rheolid	glass	12	325	NTC 30	Memosens®
S	400	7	ceramic	Rheolid	glass	12	360	NTC 30	Memosens®
S	400	7	ceramic	Rheolid	glass	12	425	NTC 30	Memosens®
platinum disc	n.a.	n.a.	ceramic	Rheolid	glass	12	120	NTC 30	Memosens®
platinum disc	n.a.	n.a.	ceramic	Rheolid	glass	12	225	NTC 30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	120	NTC 30	Memosens®

# Memosens® electrodes

Type No.	Order number	Description	Parameter	pH range	Temperature range [ °C]	Pressure range [bar]
PLA-93-225 NMSN	285114585	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PLA-93-325 NMSN	285114590	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PLA-93-360 NMSN	285114595	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PLA-93-425 NMSN	285114600	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, A glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+110 °C	pH+T	0..14	-5..110	1..12
PL H-93-120 NMSN	285114605	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-225 NMSN	285114610	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-325 NMSN	285114615	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-360 NMSN	285114620	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL H-93-425 NMSN	285114625	Low-maint. pH comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sphere membrane, H glass, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, 0...+135 °C	pH+T	0..14	0..135	1..12
PL 99-120 NMSN	285114655	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 120 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-225 NMSN	285114660	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 225 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-325 NMSN	285114665	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 325 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-360 NMSN	285114670	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 360 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12
PL 99-425 NMSN	285114675	Low-maintenance metal comb. Electrode with NTC30K, glass shaft, Silamid® ref. with silver ion trap, PTFE junction, RheoLid electrolyte with KCl storage rings, sensor platinum disk, Memosens® screw plug head, length 425 mm, 12 mm Ø, 0...14 pH, -5...+135 °C	ORP	0..14	-5..135	1..12

Membrane glass or sensor	Membrane resistance [MΩ]	Zero-point [pH]	Junction	Electrolyte	Shaft material	Shaft diameter [mm]	Length [mm]	Temperature sensor	Connection head
A	200	7	PTFE	Rheolid	glass	12	225	NTC 30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	325	NTC 30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	360	NTC 30	Memosens®
A	200	7	PTFE	Rheolid	glass	12	425	NTC 30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	120	NTC 30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	225	NTC 30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	325	NTC 30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	360	NTC 30	Memosens®
H	300	7	PTFE	Rheolid	glass	12	425	NTC 30	Memosens®
platinum disc	n.a.	n.a.	PTFE	Rheolid	glass	12	120	NTC 30	Memosens®
platinum disc	n.a.	n.a.	PTFE	Rheolid	glass	12	225	NTC 30	Memosens®
platinum disc	n.a.	n.a.	PTFE	Rheolid	glass	12	325	NTC 30	Memosens®
platinum disc	n.a.	n.a.	PTFE	Rheolid	glass	12	360	NTC 30	Memosens®
platinum disc	n.a.	n.a.	PTFE	Rheolid	glass	12	425	NTC 30	Memosens®

# 3.1

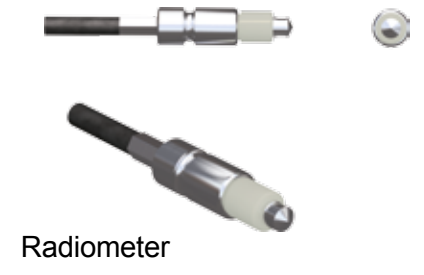
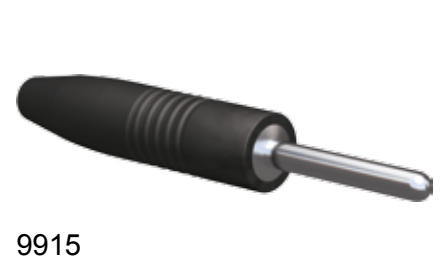
# Connection cables

Type No.	Order No.	Description
KA 01	285123617	Coaxial cable, 5 mm Ø, max. temperature 80 °C
KA 02	285123625	Coaxial cable, 5 mm Ø, max. temperature 135 °C
KA 03	285123633	Triaxial cable, 5 mm Ø, max. temperature 80 °C
KA 09	285123682	Four-wired cable, 5 mm Ø, max. temperature 80 °C
KA 18	285125889	Multi-wired cable with two coaxial cables and 4 strands, 7.5 mm Ø, max. temperature 120 °C
KA 19	285125897	Multi-wired cable with one coaxial cables and 4 strands, 6 mm Ø, max. temperature 130 °C
9907/01	285124613	Electrode socket 9907/00, 1 m two-wired cable KA 07, loose end, max. temperature 80 °C, for resistance thermometers and 2-pole-conductivity cells without temperature sensor
9907/010	285124708	The same as 9907/01, yet with 10 m cable length
9907/05	285124654	The same as 9907/01, yet with 5 m cable length
9907/21	285124716	Electrode socket 9907/00, 1 m two-wired cable KA 07, 2 x 4-mm banana plug NXX, max. temperature 80 °C, for resistance thermometers and 2-pole-conductivity cells without temperature sensor
9908/01	285124819	Electrode socket 9907/00, 1 m two-wired cable KA 07, plug 9908/00, max. temperature 80 °C, for resistance thermometers and 2-pole-conductivity cells without temperature sensor (extension cable)
9908/02	285124827	The same as 9908/01, yet with 2 m cable length
9908/05	285124851	The same as 9908/01, yet with 5 m cable length
9909/11	285125112	Electrode socket 9909/00, 1 m four-wired cable KA 09, loose end, max. temperature 80 °C, for resistance thermometers with two resistances and 2-pole-conductivity cells with temperature sensor
9909/31	285125618	Electrode socket 9909/00, 1 m two-wired cable KA 07, 2 x 4-mm banana plug NXX, max. temperature 80 °C, for platinization of 2-pole conductivity cells with temperature sensor
9910/11	285125515	Electrode socket 9909/00, 1 m four-wired cable KA 09, plug 9910/00, max. temperature 80 °C, for resistance thermometers with two resistances and 2-pole-conductivity cells with temperature sensor (extension cable)
9910/21	285125215	Electrode socket 9909/00, 1 m four-wired cable KA 10, plug 9910/00, max. temperature 80 °C, for connecting oxygen electrode OX 1101 to the meter CG 867 and as extension cable
9919/21	285125523	Electrode socket 9907/00, 1 m two-wired cable KA 07, 8-pole-connector plug, max. temperature 80°C, for 2-pole-conductivity cells without temperature sensor
9919/41	285125548	Electrode socket 9907/00, 1 m four-wired cable KA 09, 8-pole-connector plug, max. temperature 80°C, for 2-pole-conductivity cells with temperature sensor
A 1 A	285122904	DIN-connector plug AXX, 1 m coaxial cable KA 01, DIN-connector plug AXX, max. temperature 80°C
A 1 BNC	285123793	DIN-connector plug AXX, 1 m coaxial cable KA 01, BNC-connector plug, max. temperature 80°C
B 1 N	285121916	Reference electrode socket BXX, 1 m one-wired cable KA 06, 4-mm banana plug NXX, max. temperature 135°C
B 1 P	285122012	Reference electrode socket BXX, 1 m one-wired cable KA 06, 2-mm Pin plug, max. temperature 135°C
B 1 X	285121813	Reference electrode socket BXX, 1 m one-wired cable KA 06, loose end, max. temperature 135°C
B 10 X	285124502	The same as B1X, yet with 10 m cable length
B 5 X	285121854	The same as B1X, yet with 5 m cable length
K 1 A	285120217	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, DIN-connector plug AXX, max. temperature 80°C
K 1 BNC	285121213	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, BNC-connector plug, max. temperature 80°C
K 1 H	285121119	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, Lemo-connector plug, max. temperature 80°C
K 1 N	285122953	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, 4 mm Bananenstecker NXX, max. temperature 80°C
K 1 NN	285121513	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, 2 x 4 mm Bananenstecker NXX, max. temperature 80°C
K 1 S	285121616	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, coaxial plug SXX, extension cable, max. temperature 80°C
K 1 X	285120011	Coaxial electrode socket KXX, 1 m coaxial cable KA 01, loose end, max. temperature 80°C
K 1 X HT	285124116	Coaxial electrode socket KXX, 1 m coaxial cable KA 02, loose end, max. temperature 135°C
K 10 A	285120303	Coaxial electrode socket KXX, 10 m coaxial cable KA 01, DIN-connector plug AXX, max. temperature 80°C
K 10 S	285124305	Coaxial electrode socket KXX, 10 m coaxial cable KA 01, coaxial plug SXX, extension cable, max. temperature 80°C
K 10 S HT	285124408	Coaxial electrode socket KXX, 10 m coaxial cable KA 02, coaxial plug SXX, extension cable, max. temperature 135°C
K 10 X	285120106	Coaxial electrode socket KXX, 10 m coaxial cable KA 01, loose end, max. temperature 80°C
K 10 X HT	285124202	Coaxial electrode socket KXX, 10 m coaxial cable KA 02, loose end, max. temperature 135°C
K 2 A	285120225	Coaxial electrode socket KXX, 2 m coaxial cable KA 01, DIN-connector plug AXX, max. temperature 80°C
K 2 BNC	285121221	Coaxial electrode socket KXX, 2 m coaxial cable KA 01, BNC-connector, max. temperature 80°C
K 2 S	285121624	Coaxial electrode socket KXX, 2 m coaxial cable KA 01, coaxial plug SXX, extension cable, max. temperature 80°C
K 2 S HT	285124321	Coaxial electrode socket KXX, 2 m coaxial cable KA 02, coaxial plug SXX, extension cable, max. temperature 135°C
K 2 X	285120028	Coaxial electrode socket KXX, 2 m coaxial cable KA 01, loose end, max. temperature 80°C

Type No.	Order No.	Description
K 3 A	285120233	Coaxial electrode socket KXX, 3 m coaxial cable KA 01, DIN-connector AXX, max. temperature 80°C
K 3 BNC	285121238	Coaxial electrode socket KXX, 3 m coaxial cable KA 01, BNC-connector, max. temperature 80°C
K 3 S	285121632	Coaxial electrode socket KXX, 3 m coaxial cable KA 01, coaxial plug SXX, extension cable, max. temperature 80°C
K 3 S HT	285124338	Coaxial electrode socket KXX, 3 m coaxial cable KA 02, coaxial plug SXX, extension cable, max. temperature 135°C
K 3 X	285120036	Coaxial electrode socket KXX, 3 m coaxial cable KA 01, loose end, max. temperature 80°C
K 5 A	285120258	Coaxial electrode socket KXX, 5 m coaxial cable KA 01, DIN-connector AXX, max. temperature 80°C
K 5 BNC	285121254	Coaxial electrode socket KXX, 5 m coaxial cable KA 01, BNC-connector, max. temperature 80°C
K 5 S	285121657	Coaxial electrode socket KXX, 5 m coaxial cable KA 01, coaxial plug SXX, extension cable, max. temperature 80°C
K 5 S HT	285124354	Coaxial electrode socket KXX, 5 m coaxial cable KA 02, coaxial plug SXX, extension cable, max. temperature 135°C
K 5 X	285120052	Coaxial electrode socket KXX, 5 m coaxial cable KA 01, loose end, max. temperature 80°C
K 5 X HT	285124157	Coaxial electrode socket KXX, 5 m coaxial cable KA 02, loose end, max. temperature 135°C
LVP 1 ANN	285122820	VP 6-pole-electrode socket, 1 m cable KA 19, DIN-connector AXX and 2 x 4 mm banana plug NXX, max. temperature 130°C
LVP 1 BNCNN	285122830	VP 6-pole-electrode socket, 1 m cable KA 19, BNC-connector and 2 x 4 mm banana plug NXX, max. temperature 130°C
LVP 1 ST4 S	285122810	VP 6-pole-electrode socket, 1 m cable KA 19, 4-pole-step plug 9910/00 and coaxial plug SXX, max. temperature 130°C
LVP 3 ANN	285122840	VP 6-pole-electrode socket, 3 m cable KA 19, DIN-connector AXX and 2 x 4 mm banana plug NXX, max. temperature 130°C
LVP 5 BNCNN	285122860	VP 6-pole-electrode socket, 5 m cable KA 19, BNC-connector and 2 x 4 mm banana plug NXX, max. temperature 130°C
NMSN10X	285205410	Electrode socket for digital sensors with Memosens®-plug head, 10 m cable, loose end, -20...+135 °C
NMSN10XEX	285205450	Electrode socket for digital sensors with Memosens®-plug head, 10 m cable, loose end, -20...+135 °C, ATEX-version
NMSN1M8	285205380	Electrode socket for digital sensors with Memosens®-plug head, 1 m cable, connection plug for HandyLab 7XX, -15...+50 °C
NMSN1M8EX	285205290	Electrode socket for digital sensors with Memosens®-plug head, 1 m cable, connection plug for HandyLab 7XX, -15...+50 °C, ATEX-Version
NMSN20X	285205420	Electrode socket for digital sensors with Memosens®-plug head, 20 m cable, loose end, -20...+135 °C
NMSN20XEX	285205460	Electrode socket for digital sensors with Memosens®-plug head, 20 m cable, loose end, -20...+135 °C, ATEX-version
NMSN3M8EX	285205300	Electrode socket for digital sensors with Memosens®-plug head, 3 m cable, connection plug for HandyLab 7XX, -15...+50 °C, ATEX-version
NMSN3XEX	285205430	Electrode socket for digital sensors with Memosens®-plug head, 3 m cable, loose end, -20...+135 °C, ATEX-version
NMSN5X	285205400	Electrode socket for digital sensors with Memosens®-plug head, 5 m cable, loose end, -20...+135 °C
NMSN5XEX	285205440	Electrode socket for digital sensors with Memosens®-plug head, 5 m cable, loose end, -20...+135 °C, ATEX-version
VP 6-18/05	285129833	VP 6-pole-electrode socket, 5 m cable KA 18 (2 coax + 4 strands + 1 shield) max. temperature 120 °C, loose end
VP 6-18/10	1011928	VP 6-pole-electrode socket, 10 m cable KA 18 (2 coax + 4 strands + 1 shield) max. temperature 120 °C, loose end
VP 6-19/01	285129900	VP 6-pole-electrode socket, 1 m cable KA 19 (1 coax + 4 strands + 1 shield) max. temperature 130 °C, loose end
VP 6-19/03	285129970	VP 6-pole-electrode socket, 3 m cable KA 19 (1 coax + 4 strands + 1 shield) max. temperature 130 °C, loose end
VP 6-19/05	285129841	VP 6-pole-electrode socket, 5 m cable KA 19 (1 coax + 4 strands + 1 shield) max. temperature 130 °C, loose end
VP 6-19/10	285129980	VP 6-pole-electrode socket, 10 m cable KA 19 (1 coax + 4 strands + 1 shield) max. temperature 130 °C, loose end
VP 6-19/20	285129810	VP 6-pole-electrode socket, 20 m cable KA 19 (1 coax + 4 strands + 1 shield) max. temperature 130 °C, loose end



# Connection cables and plugs





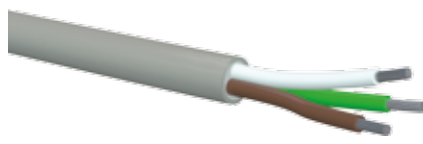
KA 01



KA 02



KA 03



KA 04



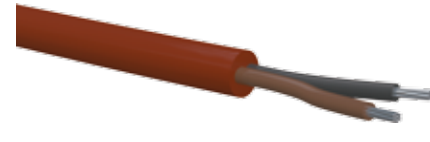
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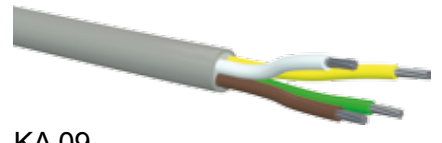
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KA 07



KA 08



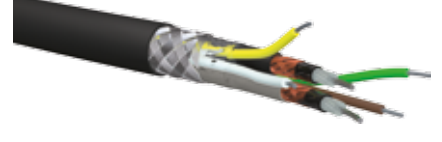
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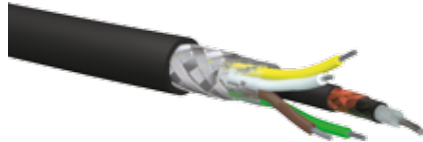
KA 10



KA 11



KA 18



KA 19



Micro coax

## 3.2

# More Accessories

Type No.	Order No.	Description
9907/00	285126047	Electrode socket, double core, for resistance thermometers and conductivity cells
9908/00	285126055	Electrode plug, double core, for extension cable and for instrument socket 9911/55
9909/00	285126063	Electrode socket, four core, for resistance thermometers and conductivity cells
9910/00	285126071	Electrode plug, four core, for extension cable and for instrument socket 9911/56
9911/50	285126088	Mounting tool, for electrode sockets 9901/00 and 9905/00
9921/51 HD	285051604	Miniature pressure electrodes holder 9921/51 HD, for reference electrodes, combination electrodes with PG 13.5
9980/51	285051756	Sealing unit, high pressure, O-ring
9980/65	285126158	PTFE diaphragm, for electrolyte key B 4491 and 9844/21
AXX	285126203	DIN plug coaxial
BXX	285123806	Electrode socket, single core, for reference electrodes and grounding rod E 1651
KXX	285123703	Coaxial plug for combination and indicator electrodes
NXX	285125983	4 mm banana plug
SXX	285123728	Coaxial socket for extension cable
Z 314	285123230	One hose plug for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 315	285123240	One hose coupling for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 316	285123250	One hose 3 m length for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 317	285123260	One hose 5 m length for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 318	285123280	One block valve for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 319	285123220	One back pressure valve for connecting FlowLine electrodes to the reservoir for electrolyte solution
Z 501	285123193	O-ring seal 10.5/1.5, for electrode plug head
Z 506	285123214	Seal cap, for plugs KXX and BXX

The new CHEMfit 340 armature

Perfect accessory for installations with 120 mm low maintenance electrodes.



## 3.3

# Buffer solutions

Type No.	Order No.	Group	Description
LR 40020	285096006	Buffer solution in a can	Buffer solution in a 20 l can, pH = 4.00
LR 70020	285096014	Buffer solution in a can	Buffer solution in a 20 l can, pH = 7.00
L 100	285138719	Buffer solution in a bottle	1000 ml DURAN® bottle, buffer solution pH = 10.01, sterilized, with manufacturer certificate
L 1004	285138057	Buffer solution in a bottle	250 ml DURAN® bottle, buffer solution pH = 10.01, sterilized, with manufacturer certificate
L 168	285137841	Buffer solution in a bottle	1000 ml DURAN® bottle, DIN buffer solution pH = 1.68, sterilized, with manufacturer certificate
L 1684	285137677	Buffer solution in a bottle	250 ml DURAN® bottle, DIN buffer solution pH = 1,68, sterilized, with manufacturer certificate
L 400	285138727	Buffer solution in a bottle	1000 ml DURAN® bottle, buffer solution pH = 4.00, sterilized, with manufacturer certificate
L 4004	285138032	Buffer solution in a bottle	250 ml DURAN® bottle, buffer solution pH = 4.00, sterilized, with manufacturer certificate
L 401	285138098	Buffer solution in a bottle	1000 ml DURAN® bottle, DIN buffer solution pH = 4.01, sterilized, with manufacturer certificate
L 4014	285138008	Buffer solution in a bottle	250 ml DURAN® bottle, DIN buffer solution pH = 4.01, sterilized, with manufacturer certificate
L 687	285138102	Buffer solution in a bottle	1000 ml DURAN® bottle, DIN buffer solution pH = 6.87, sterilized, with manufacturer certificate
L 6874	285138016	Buffer solution in a bottle	250 ml DURAN® bottle, DIN buffer solution pH = 6.87, sterilized, with manufacturer certificate
L 700	285138735	Buffer solution in a bottle	1000 ml DURAN® bottle, buffer solution pH = 7.00, sterilized, with manufacturer certificate
L 7004	285138049	Buffer solution in a bottle	250 ml DURAN® bottle, buffer solution pH = 7.00, sterilized, with manufacturer certificate
L 918	285138119	Buffer solution in a bottle	1000 ml DURAN® bottle, DIN buffer solution pH = 9.18, sterilized, with manufacturer certificate
L 9184	285138024	Buffer solution in a bottle	250 ml DURAN® bottle, DIN buffer solution pH = 9.18, sterilized, with manufacturer certificate
LC 1004 K	285139218	Buffer solution in a bottle	250 ml plastic bottle, colored buffer solution, pH = 10.01
LC 4004 K	285139156	Buffer solution in a bottle	250 ml plastic bottle, colored buffer solution, pH = 4.01
LC 7004 K	285139189	Buffer solution in a bottle	250 ml plastic bottle, colored buffer solution, pH = 7.00
L 4690	285138398	Buffer solution in FIOLAX® ampoules	2 x 30 ampoules, buffer solution pH = 4.00 / 7.00, sterilized, with manufacturer certificate
L 4691	285138205	Buffer solution in FIOLAX® ampoules	60 ampoules, buffer solution pH = 10.01, sterilized, with manufacturer certificate
L 4694	285138213	Buffer solution in FIOLAX® ampoules	60 ampoules, buffer solution pH = 4.00, sterilized, with manufacturer certificate
L 4697	285138221	Buffer solution in FIOLAX® ampoules	60 ampoules, buffer solution pH = 7.00, sterilized, with manufacturer certificate
L 4698	285138192	Buffer solution in FIOLAX® ampoules	3 x 20 ampoules, buffer solution pH = 4.00 / 7.00 / 10.01, sterilized, with manufacturer certificate
L 4790	285138402	Buffer solution in FIOLAX® ampoules	2 x 30 ampoules, DIN buffer solution pH = 4.01 / 6.87, sterilized, with manufacturer certificate
L 4791	285137977	Buffer solution in FIOLAX® ampoules	60 ampoules, DIN buffer solution pH = 1.68, sterilized, with manufacturer certificate
L 4794	285138246	Buffer solution in FIOLAX® ampoules	60 ampoules, DIN buffer solution pH = 4.01, sterilized, with manufacturer certificate
L 4796	285138254	Buffer solution in FIOLAX® ampoules	60 ampoules, DIN buffer solution pH = 6.87, sterilized, with manufacturer certificate
L 4797	285137985	Buffer solution in FIOLAX® ampoules	3 x 20 ampoules, DIN buffer solution pH = 1.68 / 6.87 / 9.18, sterilized, with manufacturer certificate
L 4798	285138238	Buffer solution in FIOLAX® ampoules	3 x 20 ampoules, DIN buffer solution pH = 4.01 / 6.87 / 9.18, sterilized, with manufacturer certificate
L 4799	285138262	Buffer solution in FIOLAX® ampoules	60 ampoules, DIN buffer solution pH = 9.18, sterilized, with manufacturer certificate
L 4893/Set	285138279	Buffer solution in FIOLAX® ampoules	2 x 9 ampoules, DIN buffer solution pH = 4.01 / 6.87, sterilized, with manufacturer certificate, 50 ml plastic bottle KCl solution 3 mol/l
L 4895/Set	285138632	Buffer solution in FIOLAX® ampoules	2 x 9 ampoules, buffer solution pH = 4.00 / 7.00, sterilized, with manufacturer certificate, 50 ml plastic bottle KCl solution 3 mol/l



- ▶ Highest reliability and accuracy
- ▶ Extremely long shelf life thanks to superheated steam sterilization
- ▶ Without preservatives
- ▶ Maximum calibration security

Benefits  
**FIOLAX®**  
 buffer ampoules

# 3.4

# Electrolyte solutions

Type No.	Order No.	Description
L 101	285136956	1000 ml DURAN® bottle, potassium chloride solution 1 mol/l, sterilized
L 1254	285138649	250 ml DURAN® bottle, potassium sulphate solution 0.6 mol/l
L 200	285138151	1000 ml DURAN® bottle, low temperature electrolyte (-30 °C)
L 2004	285138365	250 ml DURAN® bottle, low temperature electrolyte (-30 °C)
L 2114	285138349	250 ml DURAN® bottle, 2 mol/l KNO <sub>3</sub> + 0.001 mol/l KCl solution
L 2214	285136923	250 ml DURAN® bottle, 2 mol/l KNO <sub>3</sub> + 0.001 mol/l KCl solution, thickened with Tylose
L 2224	285138332	250 ml DURAN® bottle, potassium chloride solution 2 mol/l
L 300	285138554	1000 ml DURAN® bottle, potassium chloride solution 3 mol/l, sterilized
L 3004	285138427	250 ml DURAN® bottle, potassium chloride solution 3 mol/l, sterilized
L 3004 cert	285138440	250 ml DURAN® bottle, potassium chloride solution 3 mol/l, sterilized, with manufacturer certificate
L 3008	285138505	50 ml plastic bottle, potassium chloride solution 3 mol/l
L 3014	285138419	250 ml DURAN® bottle, potassium chloride solution 3 mol/l, Ag/AgCl saturated
L 310	285138468	1000 ml DURAN® bottle, gel 2 mol/l KCl, for sterilizable electrodes
L 3104	285138484	250 ml DURAN® bottle, gel 2 mol/l KCl, for sterilizable electrodes
L 320 K	285138702	1000 ml DURAN® bottle, gel 2 mol/l KCl for Ag <sub>2</sub> S electrodes
L 350	285138143	1000 ml DURAN® bottle, potassium chloride solution 3.5 mol/l, sterilized
L 3504	285138127	250 ml DURAN® bottle, potassium chloride solution 3.5 mol/l, sterilized
L 420	285138587	1000 ml DURAN® bottle, potassium chloride solution 4.2 mol/l
L 4204	285138608	250 ml DURAN® bottle, potassium chloride solution 4.2 mol/l
L 5014	285138324	250 ml DURAN® bottle, acetic acid saturated with lithium chloride
L 5034	285138308	250 ml DURAN® bottle, ethanol with 1.5 mol/l lithium chloride
L 6408	285137344	50 ml plastic bottle, electrolyte for ammonia combination electrodes
L 6708	285138513	50 ml plastic bottle, electrolyte for oxygen electrodes OX 1100/OX 1101
L 911	285138590	1000 ml DURAN® bottle, storage electrolyte solution, sterilized
L 9114	285138560	250 ml DURAN® bottle, storage electrolyte solution, sterilized
OX 920	285126606	50 ml plastic bottle, electrolyte for oxygen electrodes 9009/61



## 3.5

# Test and support solutions

Type No.	Order No.	Group	Description
LF 1024 K	285136907	Conductivity test solution	250 ml plastic bottle, test solution potassium chloride 0.01 mol/l (1.41 mS/cm)
LF CSKC 13	285126530	Conductivity test solution	250 ml conductivity test solution 1.3 microsiemens/cm, at most shelf life: sealed 3 months, opened 6 hours
LF CSKC 5	285126540	Conductivity test solution	500 ml conductivity test solution 5 microsiemens/cm, at most shelf life: sealed 6 months, open up to the maximum shelf life of 6 months
LF 990	285126503	Conductivity test solution in FIOLAX® ampoules	3 x 6 ampoules, test solution potassium chloride 0.001 mol/l (147 µS/cm)
LF 991	285126511	Conductivity test solution in FIOLAX® ampoules	3 x 6 ampoules, test solution potassium chloride 0.01 mol/l (1.41 mS/cm)
LF 992	285126528	Conductivity test solution in FIOLAX® ampoules	3 x 6 ampoules, test solution potassium chloride 0.1 mol/l (12.9 mS/cm)
LF 995	285126293	Conductivity test solution in FIOLAX® ampoules	3 x 6 ampoules, test solution potassium chloride 0.01/0.1/1 mol/l (1.41/12.9/112 mS/cm)
OX 060	285138287	Zeropoint solution	60 ampoules, zeropoint solution for oxygen electrodes, e.g. OX 1100/OX 1101
L 430	285138184	ORP testing solution in a bottle	1000 ml DURAN® bottle, ORP test solution, 430 mV Pt/calomel, 470 mV Pt/Ag/AgCl
L 4304	285138168	ORP testing solution in a bottle	250 ml DURAN® bottle, ORP test solution, 430 mV Pt/calomel, 470 mV Pt/Ag/AgCl
L 4619	285138373	ORP testing solution in FIOLAX® ampoules	60 ampoules, ORP test solution (DIN 38404-C6), 180 mV Pt/calomel, 220 mV Pt/Ag/AgCl
L 4643	285138357	ORP testing solution in FIOLAX® ampoules	60 ampoules, ORP test solution, 430 mV Pt/calomel, 470 mV Pt/Ag/AgCl
L 4648	285138784	ORP testing solution in FIOLAX® ampoules	3 x 20 ampoules, ORP test solution, 180, 430, 600 mV Pt/calomel, 220, 470, 640 mV Pt/Ag/AgCl
L 4660	285138381	ORP testing solution in FIOLAX® ampoules	60 ampoules, ORP test solution, 600 mV Pt/calomel, 640 mV Pt/Ag/AgCl
L 510	285138538	Cleaning solution	1000 ml DURAN® bottle, cleaning solution pepsin/hydrochloric acid
L 5104	285138295	Cleaning solution	250 ml DURAN® bottle, cleaning solution pepsin/hydrochloric acid
OX 921	285126614	Cleaning solution	50 ml plastic bottle, 30 ml cleaning solution for oxygen electrodes 9009/61

### Electrolyte L 3004





# 4.1 Hardware - Process equipment from experts

## SI ANALYTICS holders and accessories - System solutions for all Applications

During the development and the production of these high quality holders and their control systems, we are utilizing around 80 years of experience in liquid analytics. The continuous exchange with our customers has shown us that, generally, every application has its own requirements. The safe measurement of pH, ORP, conductivity and oxygen values as well as the temperature in the process demands custom solutions. This applies to all industrial branches, be it water treatment, food, biotech or chemical and pharmaceutical production.

Therefore, our versatile product lineup offers a wide variety of components that can be combined to solve your individual application. These system solutions allow for the optimal positioning of the sensor in the solution to be measured; even under the most harsh conditions. They significantly increase the reliability of the measurement and the life of the sensor.



## Content chapter holders:

### Holders

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## 4.2 CHEMfit

CHEMfit is a product line for the static installation of sensors with Pg 13.5 threads, a length of 120 mm and a diameter of 12 mm. Equipped with multiple types of process connections, such as Ingold DN25 (CHEMfit 310) , TriClamp (CHEMfit 311), Varivent or NEUMO Biocontrol (CHEMfit 312) NPT threads, the CHEMfit series is a universal solution.

For installation in the side of a vessel or vertical pipe run, this series is also available in a 15° model (CHEMfit 315). CHEMfit was developed following hygienic criteria for the requirements of the food and pharmaceutical industries.

Furthermore, the user can select from a series of different seal materials (including EPDM with FDA and USP VI approval). The metal model is made from stainless steel AISI 316L with a selection of surfaces finer than 0.8  $\mu\text{Ra}$  or 0.4  $\mu\text{Ra}$ . CHEMfit is designed for up to 10 bar of pressure and 140 °C.

CHEMfit 310 and lateral cut



CHEMfit 310



CHEMfit 311



CHEMfit 312BCT



CHEMfit 312VARN



CHEMfit 315VARN



CHEMfit 315



CHEMfit 340N34



Armatures

# CHEMfit 310

Type configurator:

CHEMfit 310	
Code Material (wetted parts)	
448	Stainless Steel 1.4404 / 316L Ra0.8
444	Stainless Steel 1.4404 / 316L Ra0.4
XXX	special
Code Sealing Material (wetted sealings)	
E	EPDM/FDA/USP VI
V	FPM (Viton®)
X	special
Code Sensor Type	
120	120 mm PG 13.5 Ø 12 mm
XXX	special
Code Process Connection	
IN25	G1 1/4" (DN25) O-ring-position 25 mm
XXXX	special
Code Immersion length	
070	70 mm under process connection
XXX	special
Code Protection cage	
0	without
1	with protection cage
X	special
310	- - - - - <Type No.

*CHEMfit 310  
- example of installation*



# CHEMfit

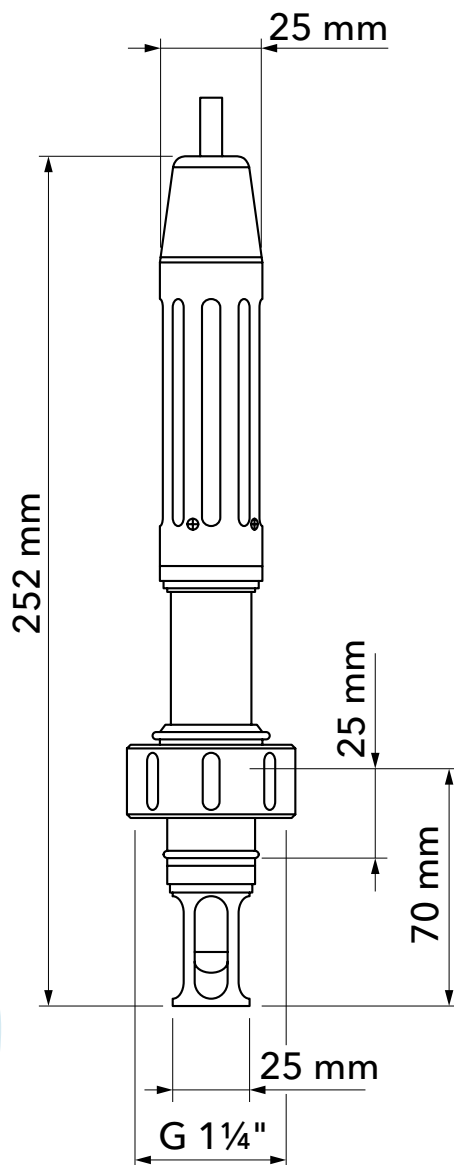
## Spare parts and accessories

Type No.	Order No.	Description
MZ PC 3XX	285063750	Protection cap CHEMfit
MZ SSC 310 E	285063640	Sealing EPDM / FDA USP IV
MZ SSC 310 V	285063650	Sealing FPM (Viton®)
MZ WIS 40 ST 44	285063720	Safety weld-in socket straight 40mm 1.4435/316L
MZ WIS 40 IC 44	285063730	Safety weld-in socket inclined 40mm 1.4435/316L

## Certificates

Type No.	Order No.	Description
MZ CERT 3XX 2.2	285063620	Certificate EN10204-2.2 for surface-finishing (wetted parts)
MZ CERT 3XX 3.1B	285063630	Certificate EN10204-3.1B for material (wetted parts)

CHEMfit 310



# CHEMfit 311

Type configurator:

## CHEMfit 311

Code Material (wetted parts)	
448	Stainless Steel 1.4404 / 316L Ra0.8
444	Stainless Steel 1.4404 / 316L Ra0.4
XXX	special

Code Sealing Material (wetted sealings)	
E	EPDM/FDA/USP VI
V	FPM (Viton®)
X	special

Code Sensor Type	
120	120 mm PG 13.5 Ø 12 mm
XXX	special

Code Process Connection	
TC15	G1 1/4" (DN25) O-ring-position 25 mm
TC20	TriClamp 2.0 (OD Ø 64 mm)
XXXX	special

Code Immersion length	
045	45 mm under process connection
080	80 mm under process connection
XXX	special

Code Protection cage	
0	without
1	with protection cage
X	special

311- - - - - < Type No.



CHEMfit 311TC

CHEMfit

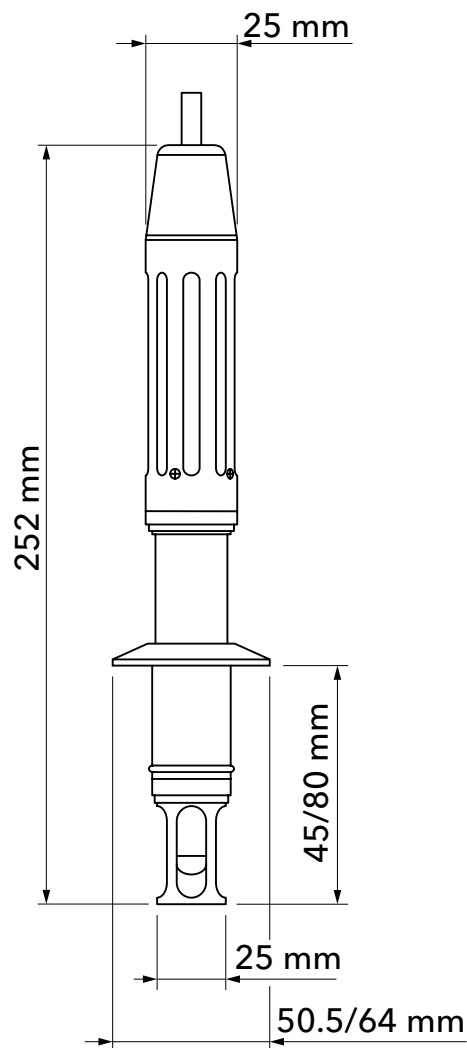
## Spare parts and accessories

Type No.	Order No.	Description
MZ PC 3XX	285063750	Protection cap CHEMfit
MZ SSC 31X V	285063770	Sealing FPM (Viton®)

## Certificates

Type No.	Order No.	Description
MZ CERT 3XX 2.2	285063620	Certificate EN10204-2.2 for surface-finishing (wetted parts)
MZ CERT 3XX 3.1B	285063630	Certificate EN10204-3.1B for material (wetted parts)

CHEMfit 311



311



# CHEMfit 312

Type configurator:

CHEMfit 312	
Code	Material (wetted parts)
448	Stainless Steel 1.4404 / 316L Ra0.8
444	Stainless Steel 1.4404 / 316L Ra0.4
XXX	special
Code	Sealing Material (wetted sealings)
E	EPDM/FDA/USP VI
V	FPM (Viton®)
X	special
Code	Sensor Type
120	120 mm PG 13.5 Ø 12 mm
XXX	special
Code	Process Connection
VARN	G1 1/4" (DN25) O-ring-position 25 mm
BCT5	NEUMO BioControl D50
XXXX	special
Code	Immersion length
040	40 mm under process connection
XXX	special
Code	Protection cage
0	without
1	with protection cage
X	special

312-	-	-	-	-	-	-	< Type No.
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CHEMfit 312



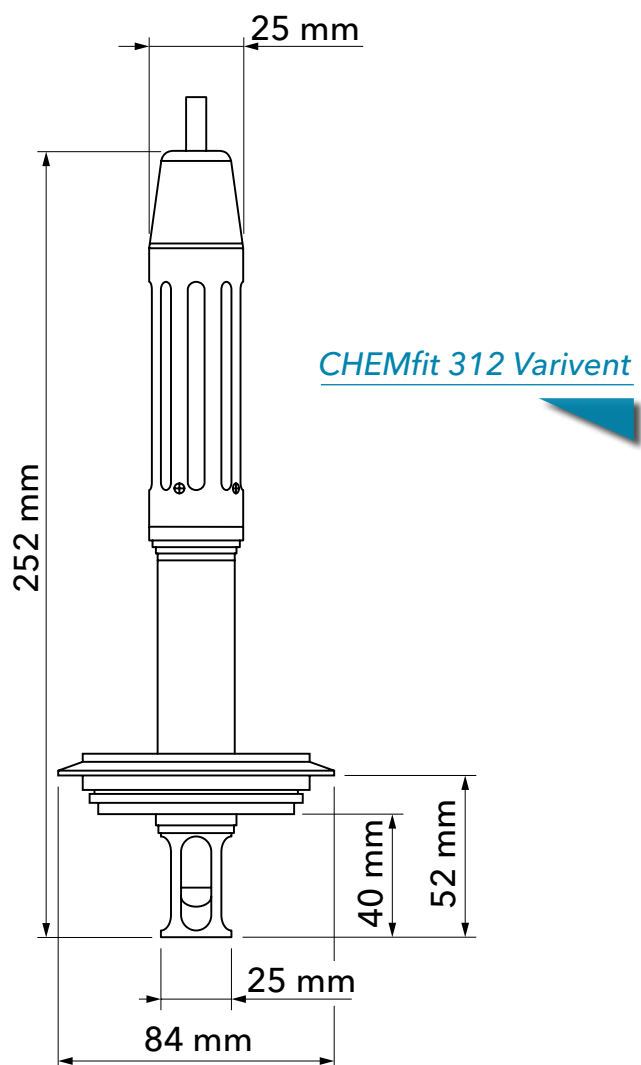
CHEMfit

## Spare parts and accessories

Type No.	Order No.	Description
MZ PC 3XX	285063750	Protection cap CHEMfit
MZ SSC 31X E	285063760	Sealing EPDM / FDA USP IV
MZ SSC 31X V	285063770	Sealing FPM (Viton®)

## Certificates

Type No.	Order No.	Description
MZ CERT 3XX 2.2	285063620	Certificate EN10204-2.2 for surface-finishing (wetted parts)
MZ CERT 3XX 3.1B	285063630	Certificate EN10204-3.1B for material (wetted parts)



# CHEMfit 315

Type configurator:

## CHEMfit 315

Code	Material (wetted parts)
448	Stainless Steel 1.4404 / 316L Ra0.8
444	Stainless Steel 1.4404 / 316L Ra0.4
XXX	special

Code	Sealing Material (wetted sealings)
E	EPDM/FDA/USP VI
V	FPM (Viton®)
X	special

Code	Sensor Type
120	120 mm PG 13.5 Ø 12 mm
XXX	special

Code	Process Connection
VARN	G1 1/4" (DN25) O-ring-position 25 mm
TC15	TriClamp 1-1,5" (OD Ø 50.5 mm)
TC20	TriClamp 2" (OD Ø 64 mm)
BCT5	NEUMO BioControl 50
XXXX	special

Code	Immersion length
034	34 mm under process connection
XXX	special

Code	Protection cage
0	without
X	special

315- - - - - < Type No.

CHEMfit 315



CHEMfit

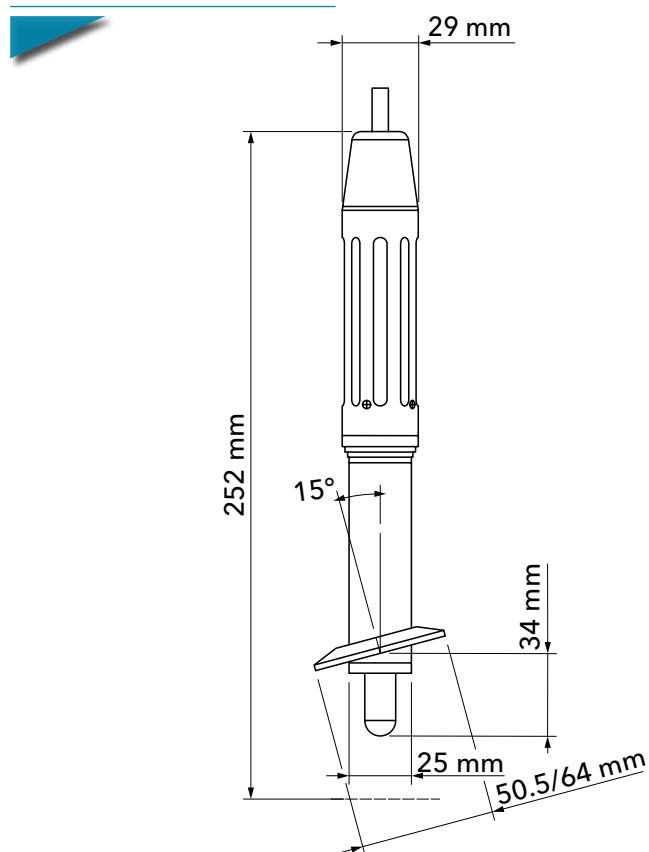
## Spare parts and accessories

Type No.	Order No.	Description
MZ PC 3XX	285063750	Protection cap CHEMfit
MZ SSC 31X E	285063760	Sealing EPDM / FDA USP IV
MZ SSC 31X V	285063770	Sealing FPM (Viton®)

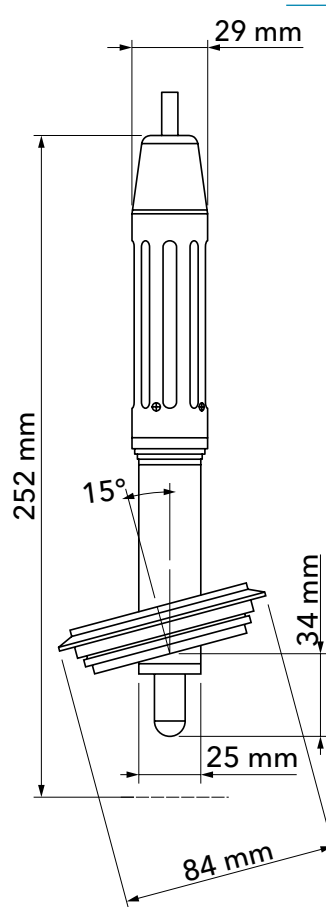
## Certificates

Type No.	Order No.	Description
MZ CERT 3XX 2.2	285063620	Certificate EN10204-2.2 for surface-finishing (wetted parts)
MZ CERT 3XX 3.1B	285063630	Certificate EN10204-3.1B for material (wetted parts)

### CHEMfit 315 TriClamp



### CHEMfit 315 Varivent



fit 315

# CHEMfit 340

Type configurator:

## CHEMfit 340

Code Material (wetted parts)

04 | Stainless Steel 1.4404 / 316L Ra0.8

PP | PP

PV | PVDF

XX | special

Code Process Connection

N10 | NPT 1"

N34 | NPT 3/4"

XXX | special

Code Sealing Material (wetted sealings)

E | EPDM/FDA/USP VI

V | FPM (Viton®)

K | FFKM (Kalrez®)

X | special

340-

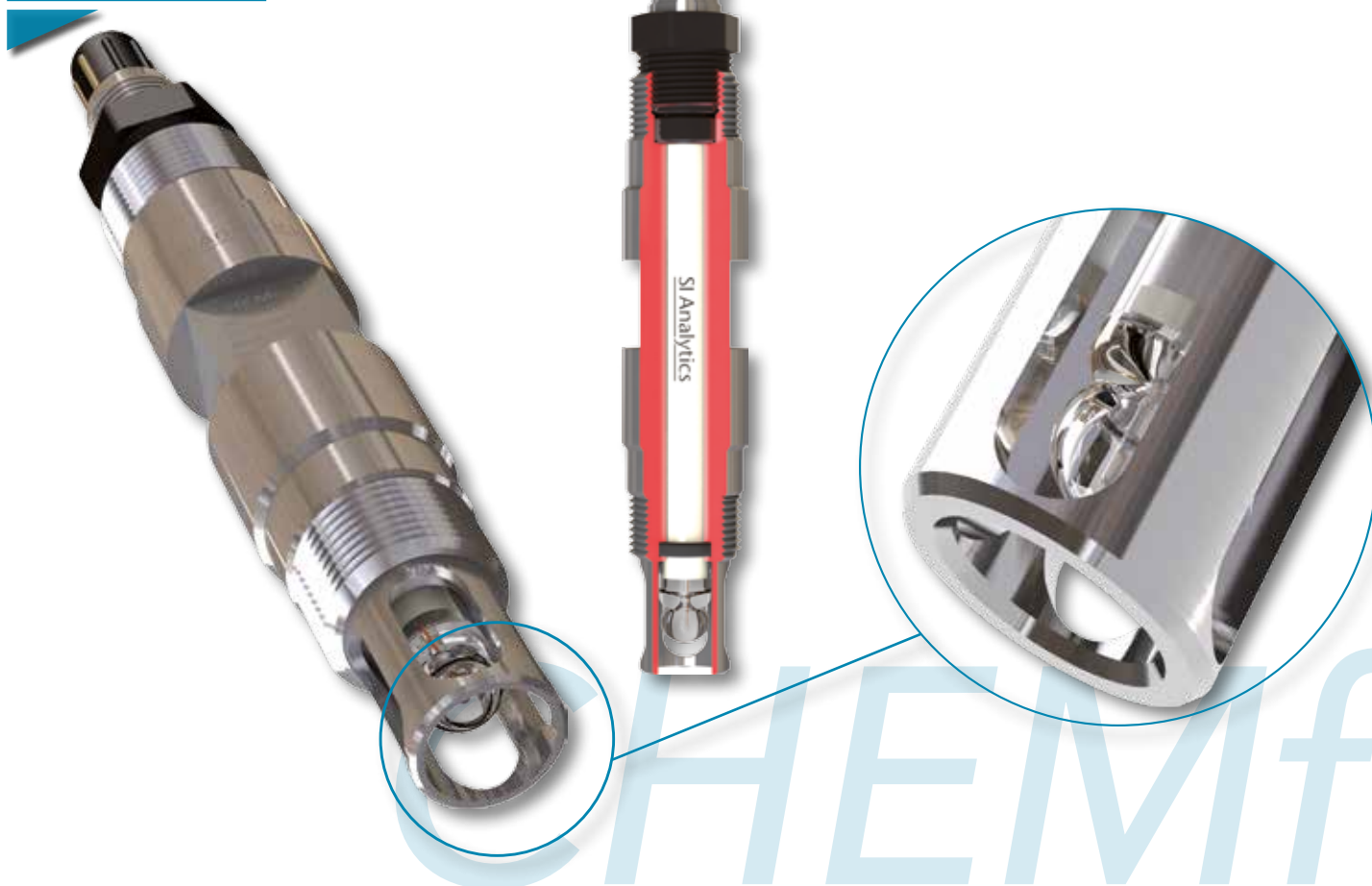
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-

< Type No.

CHEMfit 340

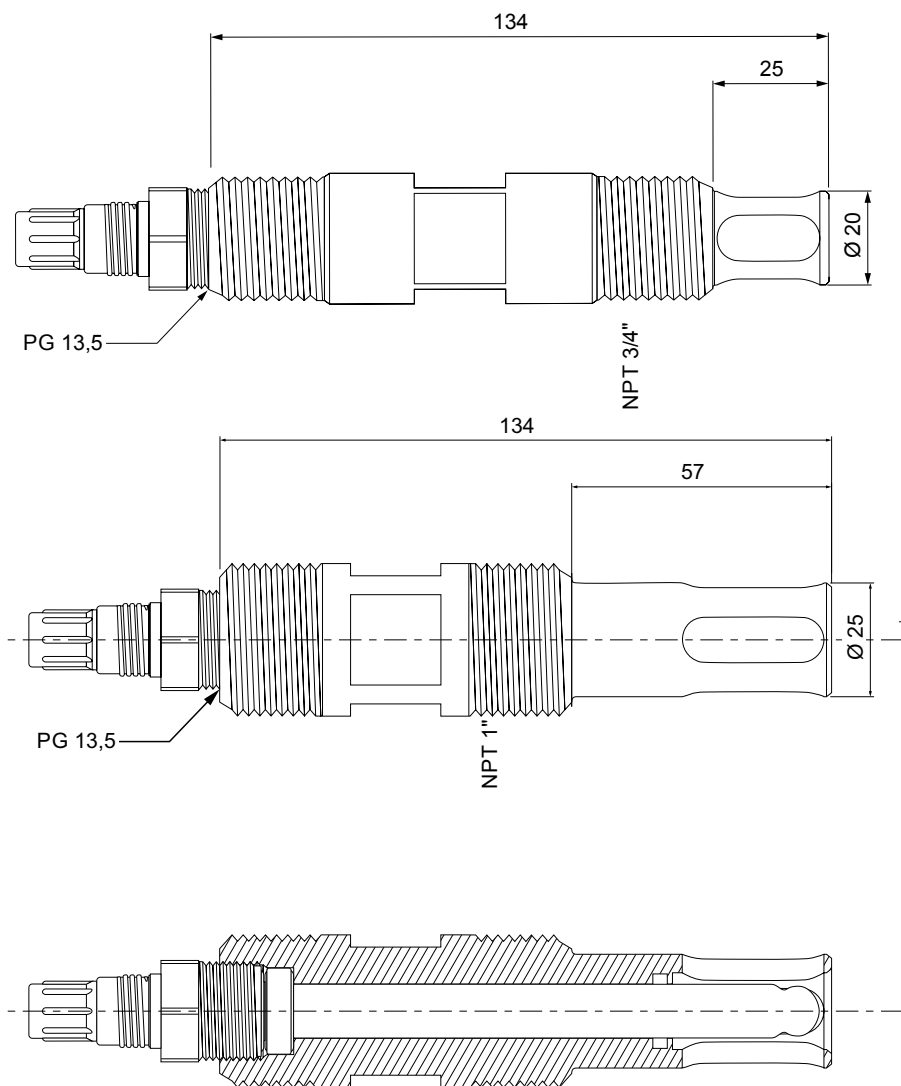


## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 31X E	285063760	Sealing EPDM / FDA USP IV
MZ SSC 31X V	285063770	Sealing FPM (Viton®)

## Certificates

Type No.	Order No.	Description
MZ CERT 3XX 3.1B	285063630	Certificate EN10204-3.1B for material (wetted parts)



CHEMfit 340

## 4.3 CHEMdip

CHEMdip holders are for fixed submersion of sensors with Pg 13.5 threads in tanks, pipes, or sump pits, or open channels. CHEMdip 910 and 915 are available in stainless steel AISI 316L/1.4404 (or Hastelloy®) and CHEMdip 920 and 925 are available in PP or PVDF. CHEMdip 910 and 920 are equipped with a DN50 process connection (DN50/2" ANSI, DN80/3" ANSI ) for low maintenance electrodes with a length of 120 mm and a diameter of 12 mm. Models 915/925 are equipped with a DN80 process connection.

The integrated orbital sensor cleaning system is a special feature which makes an external cleaning system unnecessary. This holder group offers the user simple installation and removal of the sensor. CHEMdip fittings are available with an immersion depth of 500 to 2000 mm.

Chemdip	910	915	920	925
Stainless steel	■	■		
Plastic			■	■
DN50	■		■	
DN80		■		■

CHEMdip 910



# CHEMdip



[CHEMdip 915](#)



[CHEMdip 920-D50](#)



[CHEMdip 925 D80](#)



# CHEMdip 910

Type configurator:

CHEMdip 910	
Code	Material (wetted parts)
44	Stainless Steel 1.4404 / 316L
XX	special
Code	Sealing Material (wetted sealings)
E	EPDM
V	FPM (Viton®)
X	special
Code	Sensor Type
120	120 mm PG 13.5 gel-filled
XXX	special
Code	Process Connection
D50	Flange DN50 PN16
A20	Flange ANSI 2" 150 lbs
XXX	special
Code	Immersion length
05	0.5m
10	1m
15	1.5m
20	2m
25	2.5m
XXX	special
Code	Cleaning
NC	without
SC	with integrated spray nozzle
910	- - - - - < Type No.

# CHEMd

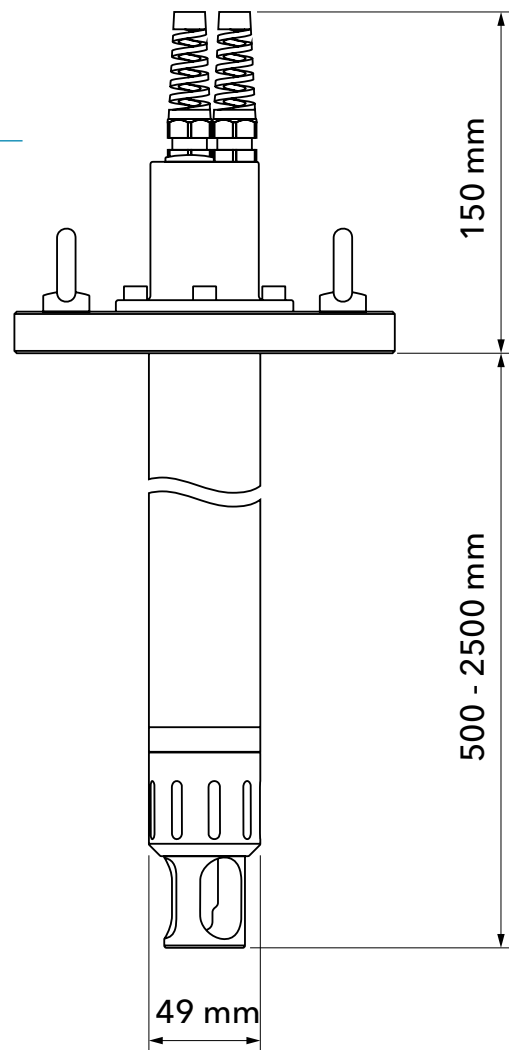
## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 910 E	285077560	Sealing Set CHEMdip 910 EPDM
MZ SSC 910 V	285077600	Sealing Set CHEMdip 910 FPM (Viton®)

CHEMdip 910  
stainless steel



CHEMdip 910



Armatures

ip 910

# CHEMdip 920

Type configurator:

CHEMdip 920	
Code Material (wetted parts)	
PP	PP
PV	PVDF
XX	special
Code Sealing Material (wetted sealings)	
E	EPDM
V	FPM (Viton®)
X	special
Code Sensor Type	
120	120 mm PG 13.5 gel-filled
XXX	special
Code Process Connection	
D50	Flange DN50 PN16
A20	Flange ANSI 2" 150 lbs
SUH	with Suspended Holder
XXX	special
Code Immersion length	
05	0.5 m
10	1 m
15	1.5 m
20	2 m
25	2.5 m
XX	special
Code Cleaning	
NC	without
SC	with integrated spray nozzle
920	- - - - - < Type No.

# CHEMd

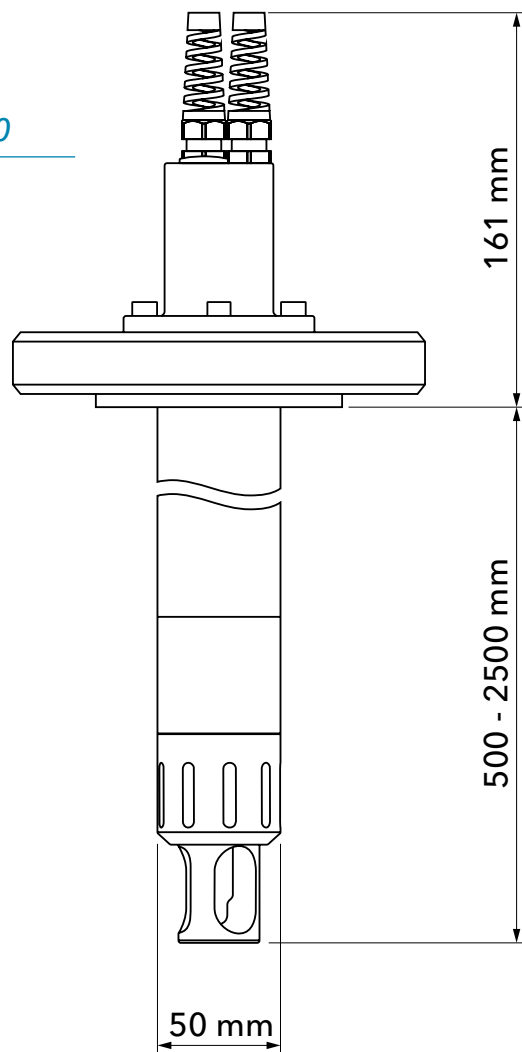
## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 920 E	285077570	Sealing Set CHEMdip 920 EPDM
MZ SSC 920 V	285077610	Sealing Set CHEMdip 920 FPM (Viton®)

CHEMdip 920



CHEMdip 920



Armatures

ip 920

# CHEMdip 915

Type configurator:

CHEMdip 915	
<b>Code Material (wetted parts)</b>	
44	Stainless Steel 1.4404 / 316L
XX	special
<b>Code Sealing Material (wetted sealings)</b>	
E	EPDM
V	FPM (Viton®)
X	special
<b>Code Sensor Type</b>	
120G	120 mm PG 13.5 gel-filled
120L	120 mm PG 13.5 liquid-filled
XXXX	special
<b>Code Process Connection</b>	
D80	Flange DN80 PN16
A30	Flange ANSI 3" 150 lbs
XXX	special
<b>Code Immersion length</b>	
05	0.5 m
10	1 m
15	1.5 m
20	2 m
25	2.5 m
XXX	special
<b>Code Cleaning</b>	
NC	without
SC	with integrated spray cleaning
915	- - - - - < Type No.

CHEMd

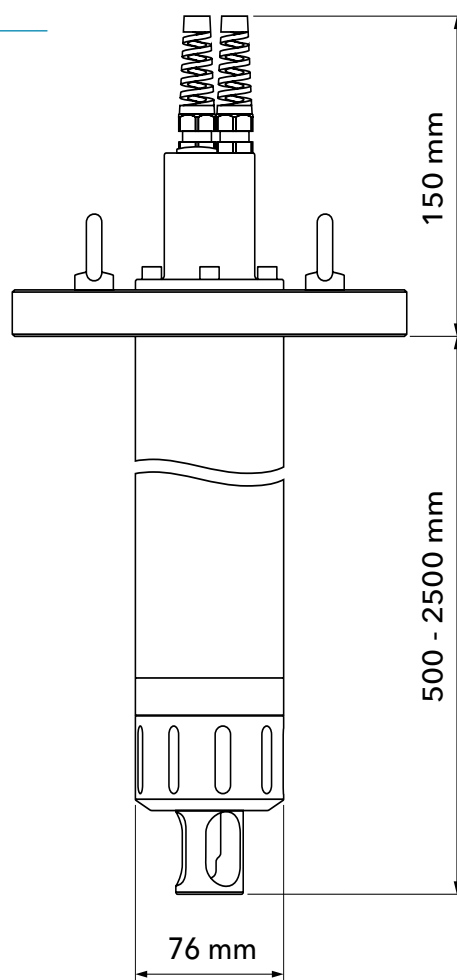
## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 915/925 E	285077590	Sealing Set CHEMdip 915/925 EPDM
MZ SSC 915/925 V	285077630	Sealing Set CHEMdip 915/925 FPM (Viton®)

CHEMdip 915



CHEMdip 915



Armatures

ip 915

# CHEMdip 925

Type configurator:

## CHEMdip 925

### Code Material (wetted parts)

PP	PP
PV	PVDF
XX	special

### Code Sealing Material (wetted sealings)

E	EPDM
V	FPM (Viton®)
X	special

### Code Sensor Type

120G	120 mm PG 13.5 gel-filled
120L	120 mm PG 13.5 liquid-filled
XXXX	special

### Code Process Connection

D80	Flange DN80 PN16
A30	Flange ANSI 3" 150 lbs
SUH	with Suspended Holder
XXX	special

### Code Immersion length

05	0.5 m
10	1 m
15	1.5 m
20	2 m
25	2.5 m
XX	special

### Code Cleaning

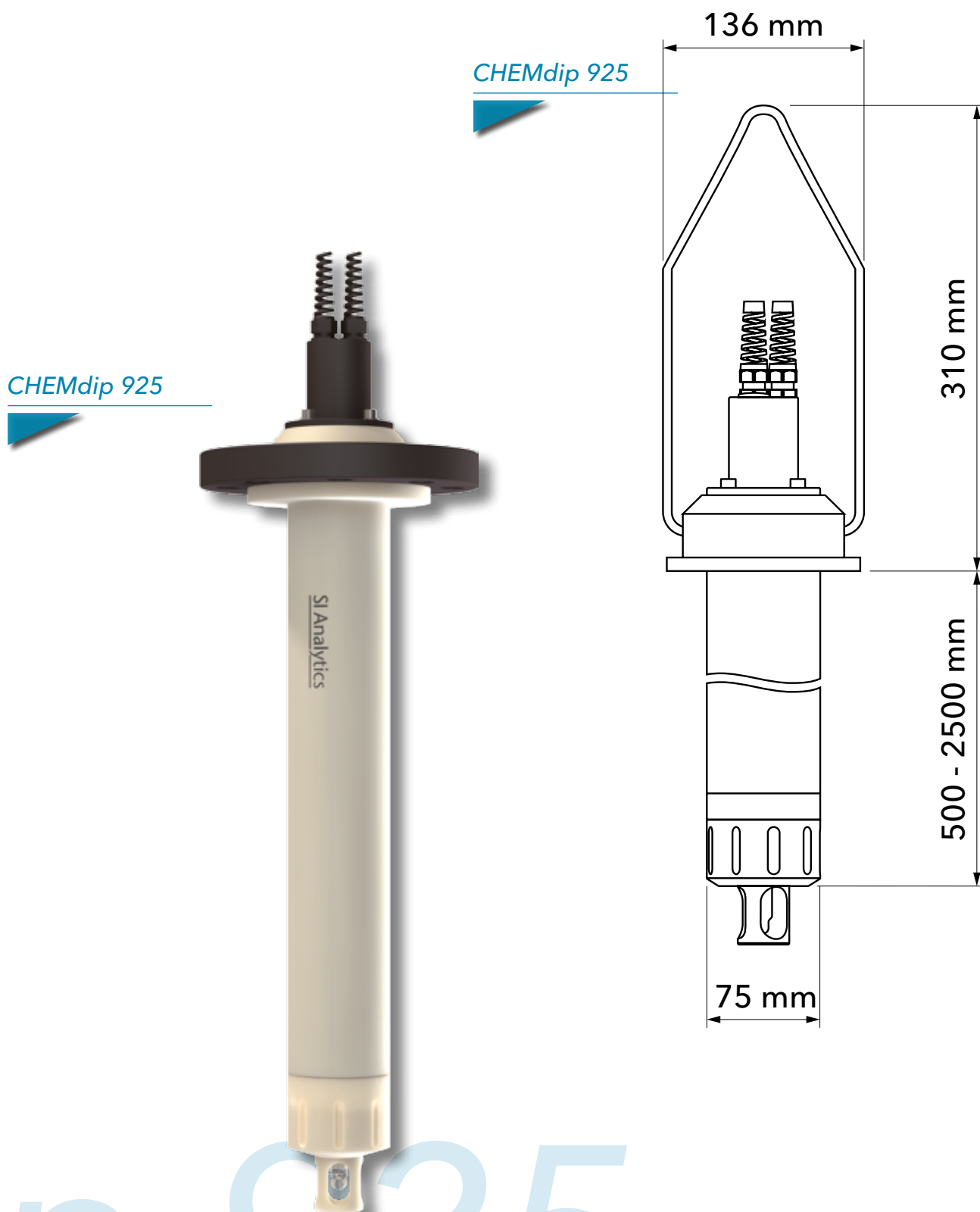
NC	without
SC	with integrated spray nozzle

925 - - - - - < Type No.

# CHEMd

## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 915/925 E	285077590	Sealing Set CHEMdip 915/925 EPDM
MZ SSC 915/925 V	285077630	Sealing Set CHEMdip 915/925 FPM





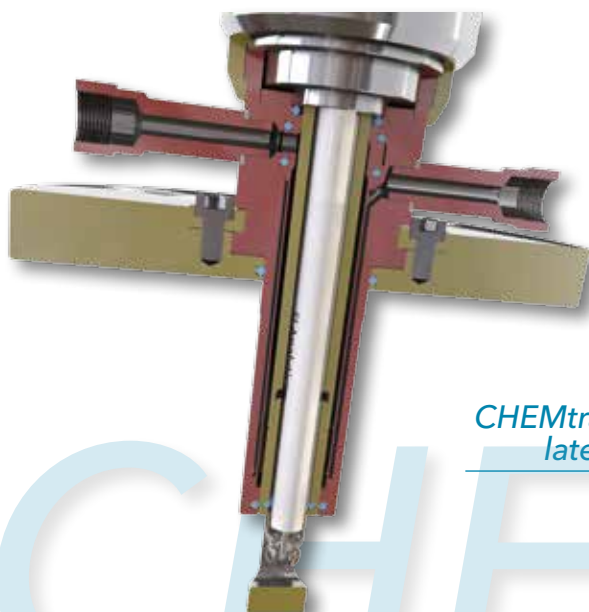
## 4.4 CHEMtrac

**Manual and automatic retractable holder** for the installation of sensors with a diameter of 12 mm and Pg 13.5 installation thread in tanks or pipes. The automatic version is the meter of choice, where a controlled sensor cleaning and/or use in EX areas is required. Suitable for all types of sensors with a diameter of 12 mm as well as a length of 225 or 325 mm as a low maintenance model or as a liquid electrolyte model with lengths of 280 or 380.

A plug and play installation is possible with the automatic models by means of a color and size-coded connection system. During the removal of the sensor, the system automatically guards against insertion into the process. Manual operation is easily possible even against 12 bar (model M). Automatic locking of the respective holder position ensures safe handling.

You can select from different materials, such as stainless steel AISI 316L/1.4404, Hastelloy®, PP, PVDF or PEEK and can choose from different seal materials (e.g. EPDM and FPM (Viton®) or FFKM (Kalrez®)). There are also different process connections to choose from (DN32, DN40, DN50, ANSI, NPT, Triclamp, Ingold DN25, Varivent, Neumo).

*CHEMtrac 810 M*



*CHEMtrac 810  
lateral cut*

# CHEMtrac



CHEMtrac 830

CHEMtrac 821M



CHEMtrac	810(M)	811(M)	820(M)	821(M)	830(M)	840M
Stainless steel	■	■			■	■
Plastic			■	■		
For hygienic processes					■	
DIN and ANSI connection	■	■	■	■		■
NPT Connection	■		■			■
Ingold DN25, Varivent, Triclamp, Neumo connection					■	
100mm immersion length	■		■		■	
200mm immersion length		■		■		
300/700mm immersion length						■
For low-maint. 120mm sensors						■
For low-maint. 225mm and 280mm liquid electrolyte sensors	■		■		■	
For 325mm low-maint. and 380mm liquid electrolyte sensors		■		■		

# CHEMtrac 810M

Type configurator:

Manual Retractable Holder CHEMtrac 810 M	
Code Material (wetted parts)	
44	Stainless Steel 1.4404 / 316L
HC	Alloy C22 2.4602
XX	special
Code Sealing Material (wetted sealings)	
E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special
Code Sensor	
225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	special
Code Process Connection	
D32	Flange DN32 PN16
D40	Flange DN40 PN16
D50	Flange DN50 PN16
A14	Flange ANSI 1 1/4" 150 lbs
A12	Flange ANSI 1 1/2" 150 lbs
A20	Flange ANSI 2" 150 lbs
N14	NPT M 1 1/4"
T20	Tri Clamp 2"
XXX	special
Code Cleaning Connection	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special
Code Position switch	
00	without
XX	special
810M-	- - - - - < Type No.

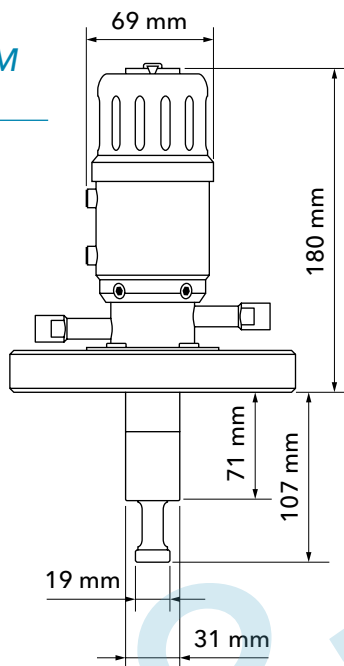
CHEMtrac 810M



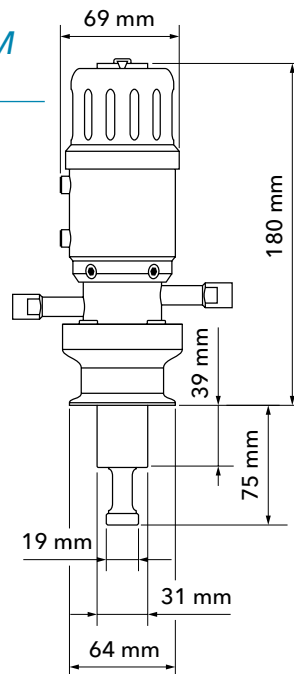
## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set blind plug G1/8" 1.4301/316 for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Manual Drive Unit - sensor 225/325
MZ DUC 8XX 280/380 PN	285063530	Manual Drive Unit - sensor 280/380
MZ IRC 810 44	285063480	Insertion rod CHEMtrac 810 1.4404 / 316L
MZ IRC 810 HC	285063500	Insertion rod CHEMtrac 810 2.4602 / Alloy C22
MZ SSC 810/820 E	285063660	Sealing set CHEMtrac 810/820 EPDM
MZ SSC 810/820 K	285063700	Sealing set CHEMtrac 810/820 FFKM (Kalrez®)
MZ SSC 810/820 V	285063680	Sealing set CHEMtrac 810/820 FPM (Viton®)

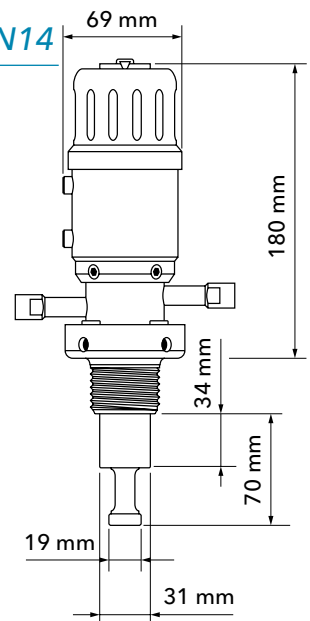
*CHEMtrac 810M  
with flange*



*CHEMtrac 810M  
TriClamp T20*



*CHEMtrac 810M N14*



# CHEMtrac 811M

Type configurator:

## pH-Retractable Holder CHEMtrac 811 M

### Code Material (wetted parts)

44	Stainless Steel 1.4404 / 316L
HC	Alloy C22 2.4602
XX	special

### Code Sealing Material (wetted sealings)

E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special

### Code Sensor

325	325 mm PG 13.5 gel-filled
380	380 mm PG 13.5 liquid-filled
XXX	special

### Code Process Connection

D40	Flange DN40
D50	Flange DN50
A12	Flange ANSI 1 1/2"
A20	Flange ANSI 2"
XXX	special

### Code Cleaning Connection

G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special

### Code Position switch

00	without
XX	special

811M- - - - - < Type No.

CHEMtrac 811M

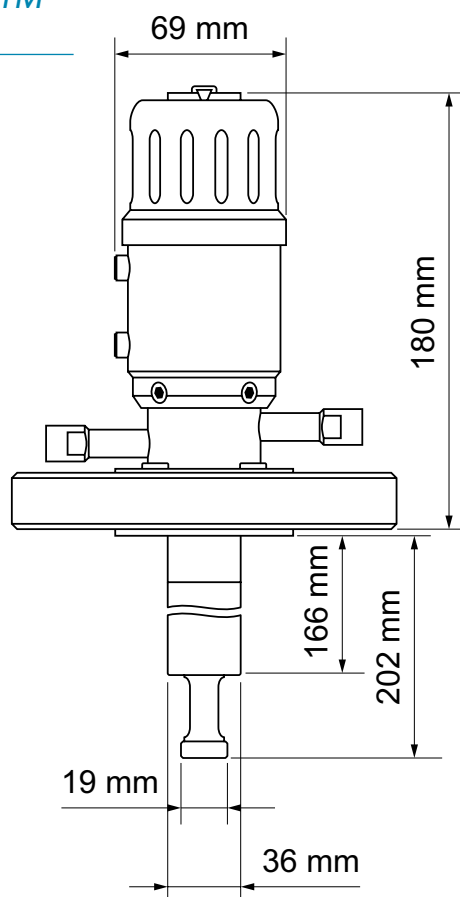


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set blind plug G1/8" 1.4301/316 for cleaning chamber
MZ DUC 8XXM 225/335	285077540	Manual Drive Unit - sensor 225/325
MZ DUC 8XXM 280/380	285077550	Manual Drive Unit - sensor 280/380
MZ IRC 811 44	285063490	Insertion rod CHEMtrac 811 1.4404 / 316L
MZ IRC 811 HC	285063510	Insertion rod CHEMtrac 811 2.4602 / Alloy C22
MZ SSC 811/821 E	285063670	Sealing Set CHEMtrac 811/821 EPDM
MZ SSC 811/821 K	285063710	Sealing Set CHEMtrac 811/821 FFKM (Kalrez®)
MZ SSC 811/821 V	285063690	Sealing Set CHEMtrac 811/821 FPM (Viton®)

*CHEMtrac 811M  
with flange*



ac 811M

# CHEMtrac 820M

Type configurator:

Manual Retractable Holder CHEMtrac 820 M	
<b>Code Material (wetted parts)</b>	
PP	PP
PV	PVDF
PK	PEEK
XX	Special
<b>Code Sealing Material (wetted sealings)</b>	
E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	Special
<b>Code Sensor</b>	
225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	Special
<b>Code Process Connection</b>	
D50	Flange DN50
A20	Flange ANSI 2"
N14	NPT M 1 1/4"
XXX	Special
<b>Code Cleaning Connection</b>	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	Special
<b>Code Position switch</b>	
00	without
XX	Special
820M- - - - - < Type No.	

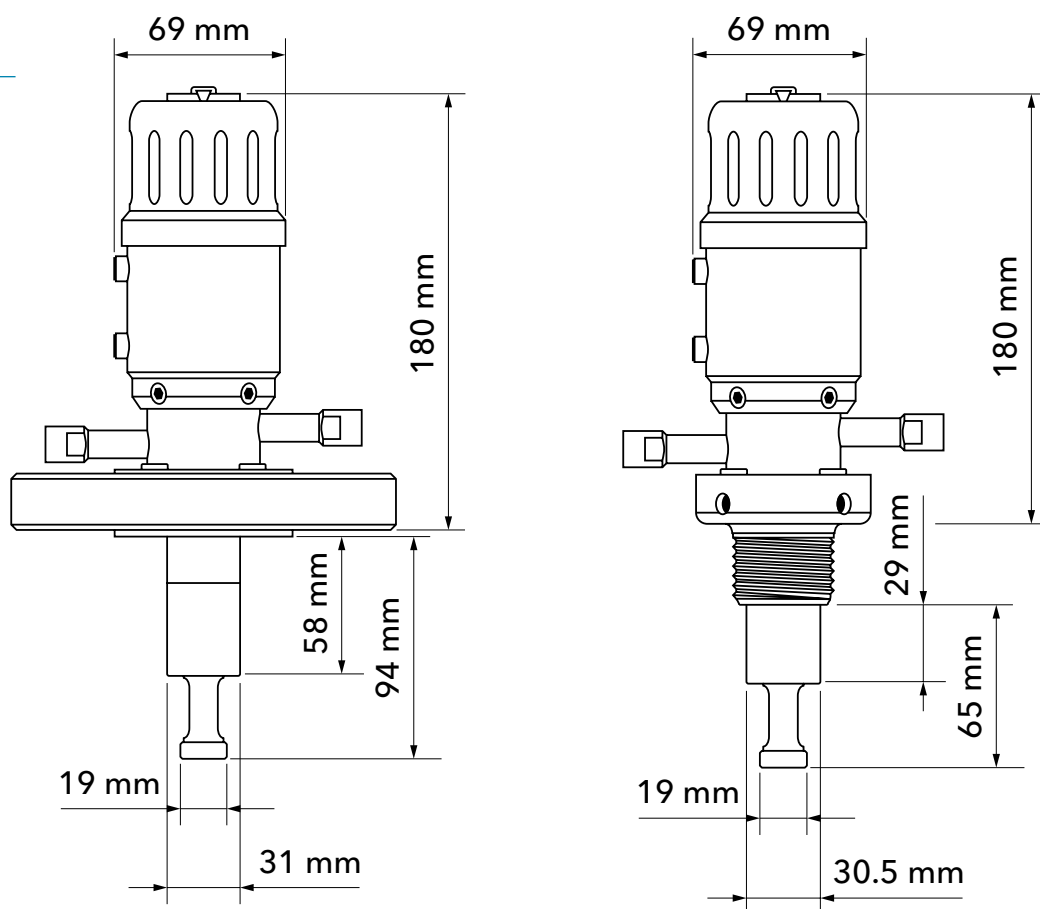
CHEMtrac 820M



## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 PV	285063570	Set blind plug G1/8" PVDF for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Manual Drive Unit - sensor 225/325
MZ DUC 8XX 280/380 PN	285063530	Manual Drive Unit - sensor 280/380
MZ IRC 820 PP	285063430	Insertion rod CHEMtrac 820 PP
MZ IRC 820 PV	285063440	Insertion rod CHEMtrac 820 PVDF
MZ IRC 820 PK	285063460	Insertion rod CHEMtrac 820 PEEK
MZ SSC 810/820 E	285063660	Sealing Set CHEMtrac 810/820 EPDM
MZ SSC 810/820 V	285063680	Sealing Set CHEMtrac 810/820 FPM (Viton®)
MZ SSC 810/820 K	285063700	Sealing Set CHEMtrac 810/820 FFKM (Kalrez®)

CHEMtrac 820M



Armatures

ac 820M



# CHEMtrac 821M

Type configurator:

Manual Retractable Holder CHEMtrac 821 M	
<b>Code Material (wetted parts)</b>	
PV	PVDF
PK	PEEK
XX	special
<b>Code Sealing Material (wetted sealings)</b>	
E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special
<b>Code Sensor</b>	
325	325 mm PG 13.5 gel-filled
380	380 mm PG 13.5 liquid-filled
XXX	special
<b>Code Process Connection</b>	
D50	Flange DN50
A20	Flange ANSI 2"
XXX	Sonderausführung
<b>Code Cleaning Connection</b>	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special
<b>Code Position switch</b>	
00	without
XX	special
821M-	- - - - - < Type No.

CHEMtrac 821M

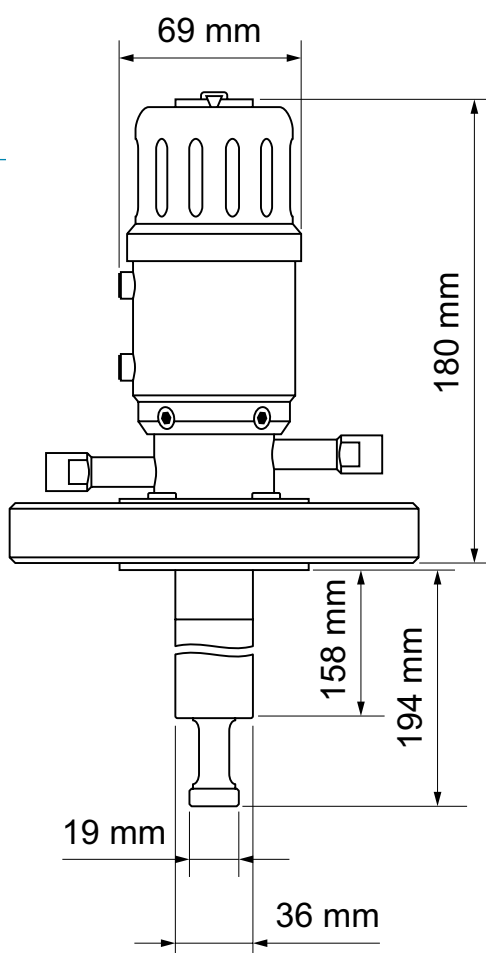


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 PV	285063570	Set blind plug G1/8" PVDF for cleaning chamber
MZ IRC 821 PV	285063450	Insertion rod CHEMtrac 821 PVDF/Alloy C22
MZ IRC 821 PK	285063470	Insertion rod CHEMtrac 821 PEEK
MZ SSC 811/821 E	285063670	Sealing Set CHEMtrac 811/821 EPDM
MZ SSC 811/821 V	285063690	Sealing Set CHEMtrac 811/821 FPM
MZ SSC 811/821 K	285063710	Sealing Set CHEMtrac 811/821 FFKM (Kalrez®)

*CHEMtrac 821M  
with flange*



# CHEMtrac 830M

Type configurator:

## Manual Retractable Holder CHEMtrac 830 hygenic

Code Material (wetted parts)	
44	Stainless Steel 1.4404 / 316L
XX	special

Code Sealing Material (wetted sealings)	
E	EPDM/FDA
V	FPM (Viton®)
X	special

Code Sensor	
225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	special

Code Process Connection	
I28	Ingold DN25 (G1 1/4") O-Ring-Position 28 mm
VAN	Varivent N DN40-125
T15	TriClamp 1.5" (OD Ø 50.5 mm)
T20	TriClamp 2" (OD Ø 64 mm)
BT5	NEUMO BioControl 50
M50	DIN 11851 DN50
XXX	special

Code Cleaning Connection	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special

Code Position switch	
00	without
XX	special

830M- - - - - < Type No.

CHEMtrac 830M

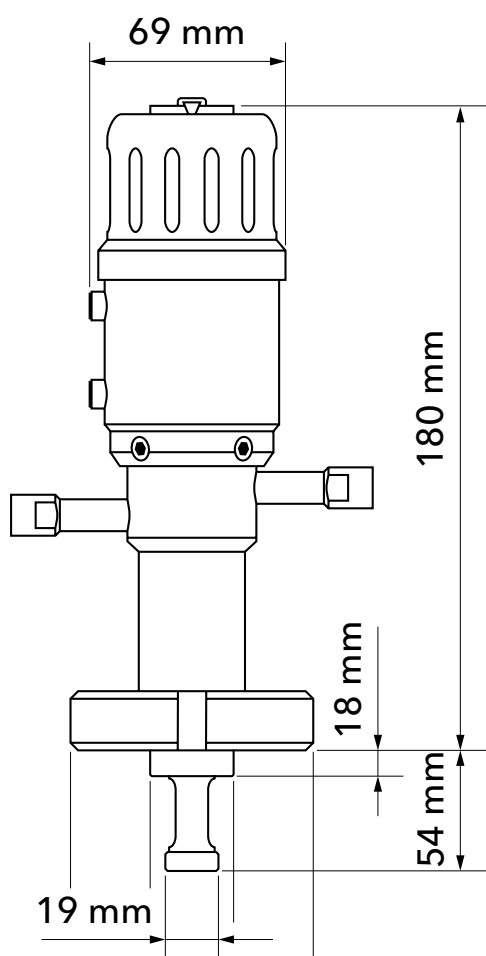


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set Blind Plug G1/81.4301/316 for clean chamber
MZ DUC 8XXM 225/335	285077540	Manual Drive Unit - sensor 225/325
MZ DUC 8XXM 280/380	285077550	Manual Drive Unit - sensor 280/380
MZ IRC 810 44	285063480	Insertion rod CHEMtrac 830 1.4404 / 316L
MZ SSC 830 E I	285077640	Sealing Set CHEMtrac 830 EPDM/FDA (IN28 only)
MZ SSC 830 E	285077660	Sealing Set CHEMtrac 830 EPDM/FDA (all other types)
MZ SSC 830 V I	285077670	Sealing Set CHEMtrac 830 FPM (Ingold only)
MZ SSC 830 V	285077690	Sealing Set CHEMtrac 830 FPM (all other types)

CHEMtrac 830M



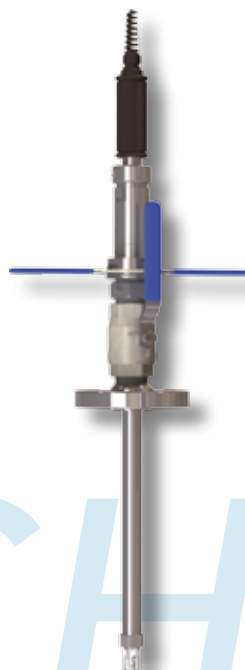
trac 830M

# CHEMtrac 840M

Type configurator:

manual retractable holder with ball valve	
Code	Material (wetted parts)
44	Stainless Steel 1.4404 / 316L
XXXX	special
Code	Sealing Material (wetted sealings)
E	EPDM
V	FPM (Viton®)
F	FFKM (Kalrez®)
XXX	special
Code	Immersion length (nominal)
3	300 mm
7	700 mm
XX	special
Code	Sensor Type
120	120mm - Sensor PG13,5
XXX	Special Option
Code	Process Connection
FD32O	Flange DN32 PN16 without ball valve
FD32B	Flange DN32 PN16 with ball valve
FA14O	Flange ANSI 1 1/4" without ball valve
FA14B	Flange ANSI 1 1/4" with ball valve
G14MO	Thread G1 1/4" male without ball valve
G14FB	Thread G1 1/4" female with ball valve
N14MO	Thread NPT1 1/4" male without ball valve
XXXXX	special
Code	Cleaning Connection
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special
840M -	- - - - - < Type No.

*CHEMtrac 840M  
with ball valve  
and flange*

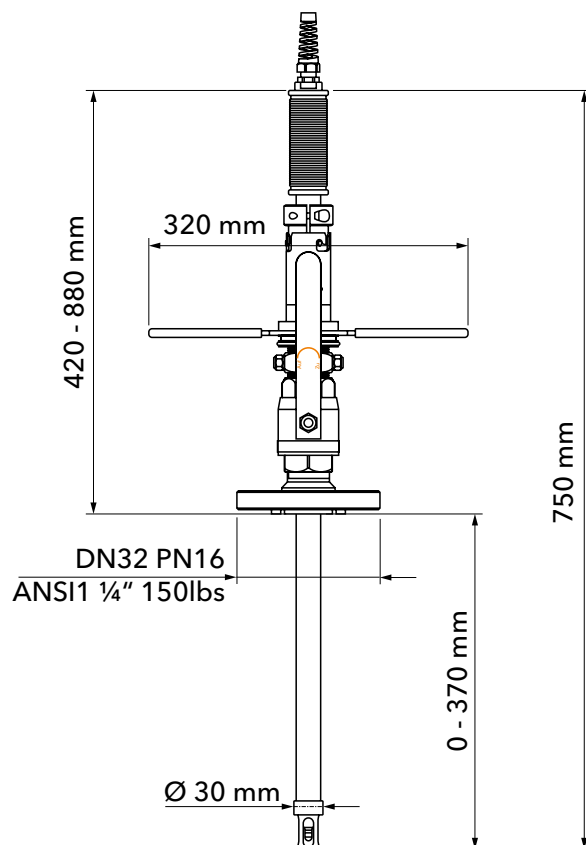


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ SSC 840 E	285077930	Sealing set CHEMtrac840M - EPDM
MZ SSC 840 F	285077950	Sealing set CHEMtrac840M - FFKM
MZ SSC 840 SH	285077960	Sensor holder 840M/PG13.5 1.4404/316L
MZ SSC 840 V	285077940	Sealing set CHEMtrac840M - FPM (Viton®)

### CHEMtrac 840M with ball valve



trac 840M

# CHEMtrac 810

Type configurator:

## pH-Retractable Holder CHEMtrac 810

### Code Material (wetted parts)

44	Stainless Steel 1.4404 / 316L
HC	Alloy C22 2.4602
XX	special

### Code Sealing Material (wetted sealings)

E	EPDM
V	FPM (Viton®) (Viton®)
K	FFKM (Kalrez®)
X	special

### Code Sensor type

225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	special

### Code Process Connection

D32	Flange DN32 PN16
D40	Flange DN40 PN16
D50	Flange DN50 PN16
A14	Flange ANSI 1 1/4" 150 lbs
A12	Flange ANSI 1 1/2" 150 lbs
A20	Flange ANSI 2" 150 lbs
N14	NPT M 1 1/4"
T20	Tri Clamp 2"
XXX	special

### Code Cleaning Connection

G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special

### Code Position switch

CHEMtrac 810

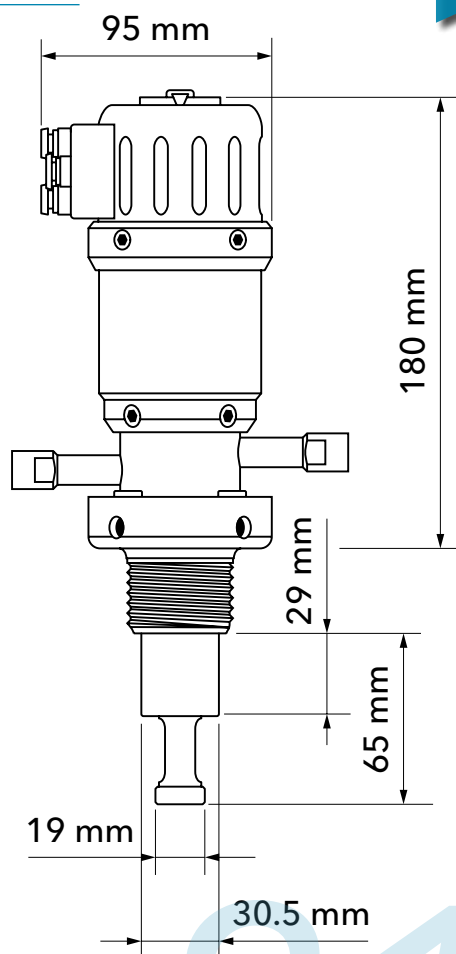


CHEMtrac

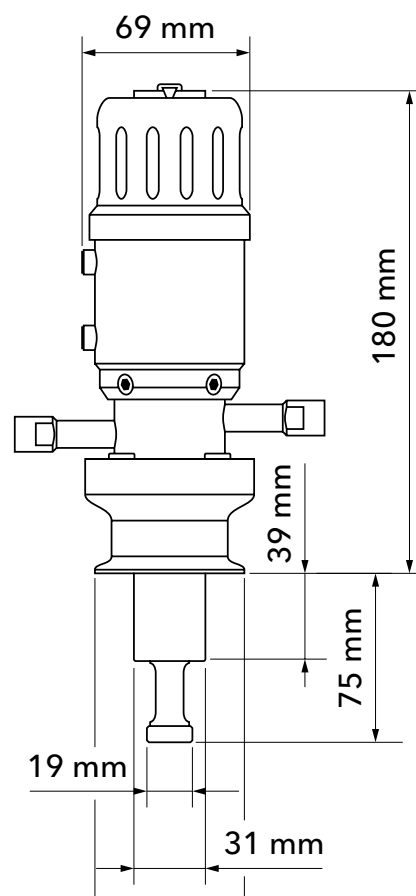
## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set blind plug G1/8" 1.4301/316 for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Drive Unit - sensor 225/325 pneum. position switch
MZ DUC 8XX 280/380 PN	285063530	Drive Unit - sensor 280/380 pneum. position switch
MZ IRC 810 44	285063480	Insertion rod CHEMtrac 810 1.4404 / 316L
MZ IRC 810 HC	285063500	Insertion rod CHEMtrac 810 2.4602 / Alloy C22
MZ SSC 810/820 E	285063660	Sealing Set CHEMtrac 810/820 EPDM
MZ SSC 810/820 K	285063700	Sealing Set CHEMtrac 810/820 FFKM (Kalrez®)
MZ SSC 810/820 V	285063680	Sealing Set CHEMtrac 810/820 FPM (Viton®)

### CHEMtrac 810 N14



### CHEMtrac 810 T20



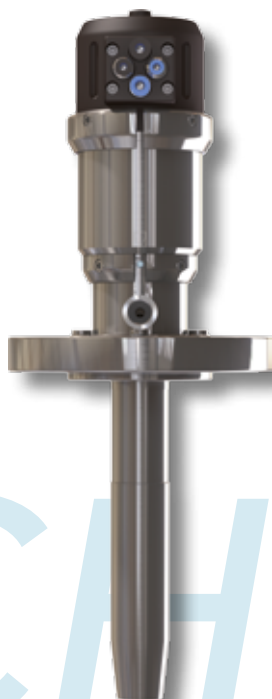


# CHEMtrac 811

Type configurator:

pH-Retractable Holder CHEMtrac 811	
Code Material (wetted parts)	
44	Stainless Steel 1.4404 / 316L
HC	Alloy C22 2.4602
XX	special
Code Sealing Material (wetted sealings)	
E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special
Code Sensor	
325	325 mm PG 13.5 gel-filled
380	380 mm PG 13.5 liquid-filled
XXX	special
Code Process Connection	
D40	Flange DN40
D50	Flange DN50
A12	Flange ANSI 1 1/2"
A20	Flange ANSI 2"
XXX	special
Code Cleaning Connection	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special
Code Position switch	
PN	pneumatic
XX	special
811- - - - - < Type No.	

CHEMtrac 811  
with flange

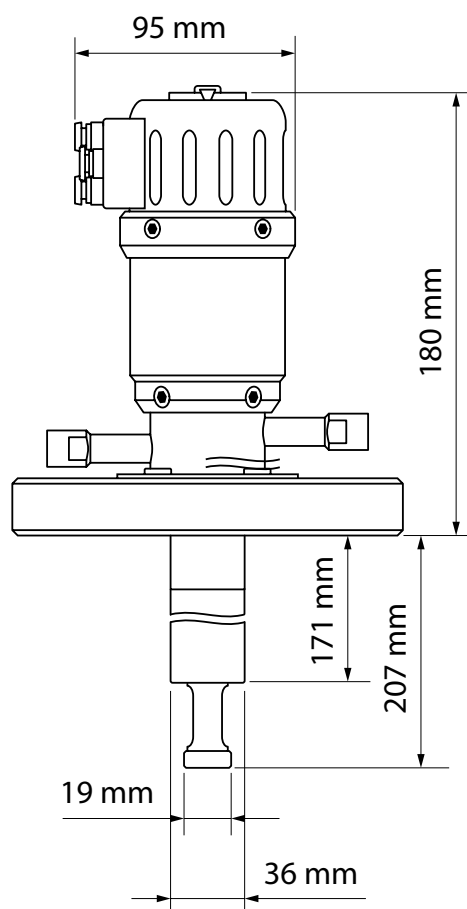


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set blind plug G1/8" 1.4301/316 for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Drive Unit - sensor 225/325 pneum. position switch
MZ DUC 8XX 280/380 PN	285063530	Drive Unit - sensor 280/380 pneum. position switch
MZ IRC 811 44	285063490	Insertion rod CHEMtrac 811 1.4404 / 316L
MZ IRC 811 HC	285063510	Insertion rod CHEMtrac 811 2.4602 / Alloy C22
MZ SSC 811/821 E	285063670	Sealing Set CHEMtrac 811/821 EPDM
MZ SSC 811/821 K	285063710	Sealing Set CHEMtrac 811/821 FFKM (Kalrez®)
MZ SSC 811/821 V	285063690	Sealing Set CHEMtrac 811/821 FPM (Viton®)

### CHEMtrac 811 with flange



ac 811

# CHEMtrac 820

Type configurator:

## pH-Retractable Holder CHEMtrac 820

Code Material (wetted parts)

PP	PP
PV	PVDF
PK	PEEK
XX	special

Code Sealing Material (wetted sealings)

E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special

Code Sensor

225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	special

Code Process Connection

D50	Flange DN50
A20	Flange ANSI 2"
N14	NPT M 1 1/4"
XXX	special

Code Cleaning Connection

G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special

Code Position switch

PN	pneumatic
XX	special

820- - - - - < Type No.

CHEMtrac 820

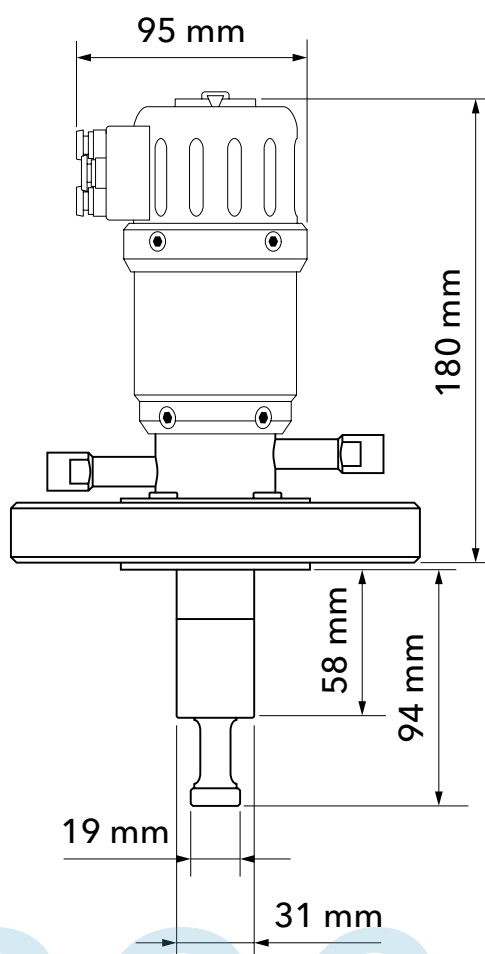


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 PV	285063570	Set blind plug G1/8" PVDF for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Drive Unit - sensor 225/325 pneum. position switch
MZ DUC 8XX 280/380 PN	285063530	Drive Unit - sensor 280/380 pneum. position switch
MZ IRC 820 PP	285063430	Insertion rod CHEMtrac 820 PP
MZ IRC 820 PV	285063440	Insertion rod CHEMtrac 820 PVDF
MZ IRC 820 PK	285063460	Insertion rod CHEMtrac 820 PEEK
MZ SSC 810/820 E	285063660	Sealing Set CHEMtrac 810/820 EPDM
MZ SSC 810/820 K	285063700	Sealing Set CHEMtrac 810/820 FFKM (Kalrez®)
MZ SSC 810/820 V	285063680	Sealing Set CHEMtrac 810/820 FPM (Viton®)

### CHEMtrac 820



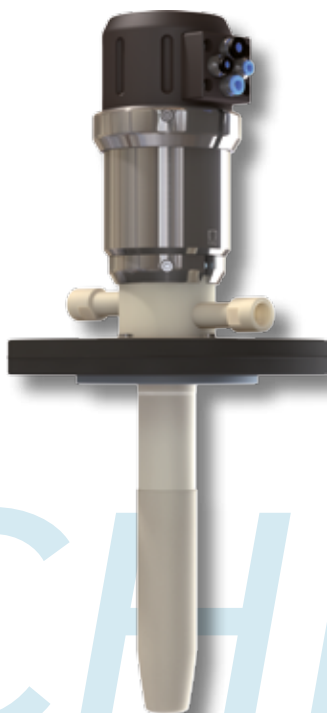
ac 820

# CHEMtrac 821

Type configurator:

pH-Retractable Holder CHEMtrac 821	
Code Material (wetted parts)	
PV	PVDF
PK	PEEK
XX	special
Code Sealing Material (wetted sealings)	
E	EPDM
V	FPM (Viton®)
K	FFKM (Kalrez®)
X	special
Code Sensor	
325	325 mm PG 13.5 gel-filled
380	380 mm PG 13.5 liquid-filled
XXX	special
Code Process Connection	
D50	Flange DN50
A20	Flange ANSI 2"
XXX	special
Code Cleaning Connection	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special
Code Position switch	
PN	pneumatic
XX	special
821-	- - - - - < Type No.

CHEMtrac 821  
with flange A20

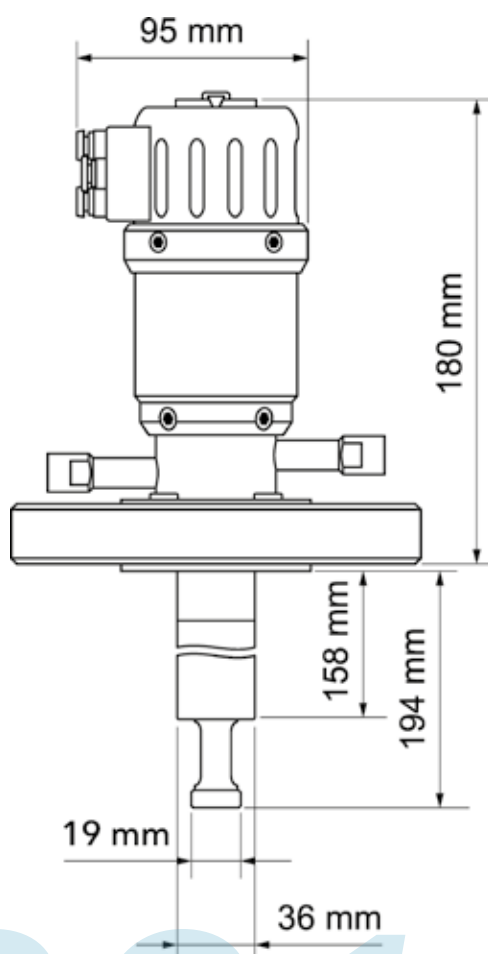


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 PV	285063570	Set blind plug G1/8" PVDF for cleaning chamber
MZ DUC 8XX 225/335 PN	285063520	Drive Unit - sensor 225/325 pneum. position switch
MZ DUC 8XX 280/380 PN	285063530	Drive Unit - sensor 280/380 pneum. position switch
MZ IRC 821 PV	285063450	Insertion rod CHEMtrac 821 PVDF
MZ IRC 821 PK	285063470	Insertion rod CHEMtrac 821 PEEK
MZ SSC 811/821 E	285063670	Sealing Set CHEMtrac 811/821 EPDM
MZ SSC 811/821 K	285063710	Sealing Set CHEMtrac 811/821 FFKM (Kalrez®)
MZ SSC 811/821 V	285063690	Sealing Set CHEMtrac 811/821 FPM

*CHEMtrac 821  
with flange A20*



ac 821

# CHEMtrac 830

Type configurator:

## pH-Retractable Holder CHEMtrac 830 hygenic

Code Material (wetted parts)	
44	Edelstahl 1.4404 / 316L
XX	special

Code Sealing Material (wetted sealings)	
E	EPDM/FDA
V	FPM (Viton®)
X	special

Code Sensor	
225	225 mm PG 13.5 gel-filled
280	280 mm PG 13.5 liquid-filled
XXX	special

Code Process Connection	
I28	Ingold DN25 (G1 1/4") O-Ring-Position 28 mm
VAN	Varivent N DN40-125
T15	TriClamp 1.5" (OD Ø 50.5 mm)
T20	TriClamp 2" (OD Ø 64 mm)
BT5	NEUMO BioControl 50
M50	DIN 11851 DN50
XXX	special

Code Cleaning Connection	
G18	G 1/8" thread female
G14	G 1/4" thread female
N14	1/4" NPT female
XXX	special

Code Position switch	
PN	pneumatic
XX	special

830- - - - - < Type No.

CHEMtrac 830 DN25

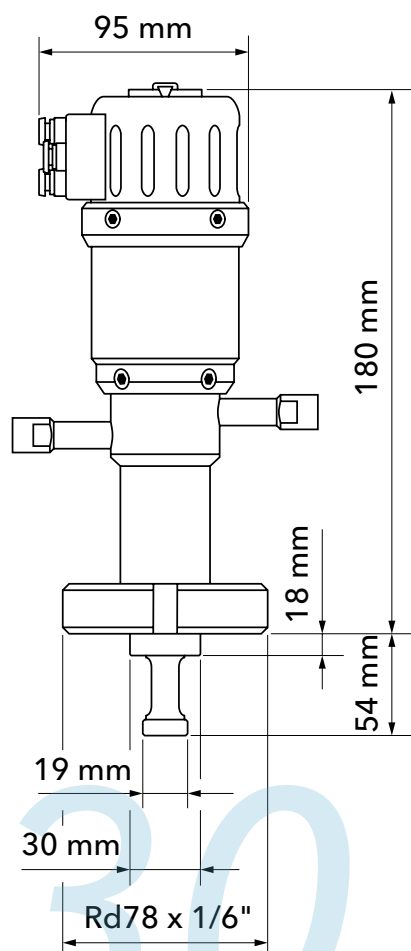


CHEMtrac

## Spare parts and accessories

Type No.	Order No.	Description
MZ BP G18 43	285063580	Set blind plug G1/8" 1.4301/316 for cleaning chamber
MZ DUC 8XX 225/325 PN	285063520	Drive Unit - sensor 225/325 pneum. position switch
MZ DUC 8XX 225/335 PN	285063530	Drive Unit - sensor 280/380 pneum. position switch
MZ IRC 810 44	285063480	Insertion rod CHEMtrac 830 1.4404 / 316L
MZ SSC 830 E I	285077640	Sealing Set CHEMtrac 830 EPDM/FDA (IN28 only)
MZ SSC 830 E BV	285077650	Sealing Set CHEMtrac 830 EPDM/FDA (BCT5 / VARN only)
MZ SSC 830 E	285077660	Sealing Set CHEMtrac 830 EPDM/FDA (all other types)
MZ SSC 830 V I	285077670	Sealing Set CHEMtrac 830 FPM (Ingold only)
MZ SSC 830 V BV	285077680	Sealing Set CHEMtrac 830 FPM (BCT5 / VARN only)
MZ SSC 830 V	285077690	Sealing Set CHEMtrac 830 FPM (all other types)

### CHEMtrac 830 M50





# 4.5 CHEMtrol 450

Type configurator:

Pneumatic Control Unit for Retractable	
<b>Code Housing</b>	
GF	Plastic housing
SS	Stainless steel housing
XX	special
<b>Code Cleaning</b>	
1	for one cleaning solution
2	for two cleaning solutions
X	special
<b>Code Drain port</b>	
0	without
1	with port for drain valve
<b>Code Connecting hose</b>	
00	without
03	3 m length
05	5 m length
10	10 m length
XX	special
<b>Code Fastener</b>	
00	without
CT	Fastening angle CHEMtrac
XX	special
450-	- - - - - < Type No.

CHEMtrol 450



## Spare parts and accessories

Type No.	Order No.	Description
MZ CVS 2 PV	285063600	Cleaning valve set PVDF/FPM with 2 membrane-valves for one cleaning solution and one drain; connectors, PTFE-tubing and mounting brackets included
MZ CVS 3 PV	285063610	Cleaning valve set PVDF/FPM with 3 membrane-valves for two cleaning solutions and one drain; connectors, PTFE-tubing and mounting brackets included
MZ MV PV G3/8	285063590	Membrane-valve PVDF/FPM (single) G3/8"; Air Ø 6; DN12 PN6 NC for Cleaning solution or drain
MZ PMS PL/SS	285063560	Pipe Mounting Set (for plastic and stainless steel)
MZ WMS PL	285063540	Wall Mounting Set (for plastic housing)
MZ WMS SS	285063550	Wall Mounting Set (for stainless steel housing)

**CHEMtrol 450** is a manual control system with cleaning function. Operated with compressed air at 6 bar. No electrical installation required.

- Integrated connection hose for retractable holders.
- You can control up to two different cleaning solutions.
- Sensor position is provided.
- Choice of plastic or stainless steel model.
- Different pipe and wall mounting sets available as accessories.
- Different valve sets available as accessories.

# o/450

# CHEMtrol 460

Type configurator:

## Automatic Control Unit for Retractables

### Code Housing

GF	Plastic housing
SS	Stainless steel housing
XX	special

### Code Cleaning

1	for one cleaning solution
2	for two cleaning solutions
X	special

### Code Drain port

0	without
1	with port for drain valve

### Code Connecting hose

00	without
03	3 m length
05	5 m length
10	10 m length
XX	special

### Code Fastener

00	without
CT	Fastening angle CHEMtrac
XX	special

460- - - - - < Type No.

CHEMtrol 460



CHEMtr

## Spare parts and accessories

Type No.	Order No.	Description
MZ CUC 460	285063810	Control Unit CHEMtrol460
MZ CVS 2 PV	285063600	Cleaning valve set PVDF/FPM with 2 membrane-valves for one cleaning solution and one drain; connectors, PTFE-tubing and mounting brackets included
MZ CVS 3 PV	285063610	Cleaning valve set PVDF/FPM with 3 membrane-valves for two cleaning solutions and one drain; connectors, PTFE-tubing and mounting brackets included
MZ MV PV G3/8	285063590	Membrane-valve PVDF/FPM (single) G3/8"; Air Ø 6; DN12 PN6 NC for Cleaning solution or drain
MZ PMS PP/SS	285063560	Post Mounting Set (for plastic and stainless steel)
MZ PS	285063800	Pressure switch
MZ SV 3/2 G1/4	285063790	Solenoid valve 3/2-way G1/4" 24VDC 3.8W (without plug and cable)
MZ SV 5/2 G1/4	285063780	Solenoid valve 5/2-way G1/4" 24VDC 3.8W (without plug and cable)
MZ SV Plug	285063740	Plug for solenoid valve including cable
MZ WMS PL	285063540	Wall Mounting Set (for plastic housing)
MZ WMS SS	285063550	Wall Mounting Set (for stainless steel housing)

**CHEMtrol 460** is an electro-pneumatic control system with individually programmable controls as well as cleaning and block water function. Can work with any transmitter and every pneumatic holder.

- Integrated connection hose for retractable holder.
- You can control up to two different cleaning solutions.
- Sensor position is provided.
- Choice of plastic or stainless steel model.
- Different pipe and wall mounting sets available as accessories.
- Different valve sets available as accessories.

# o/460

## 4.6 CHEMflow 710

Type configurator:

### Flow Through Vessel CHEMflow 710

Code	Material
71	Stainless Steel 1.4571 / 316Ti
ET	Stainless Steel 1.4571 / 316Ti ETFE lined
XX	special

Code	Process Connection
D25	Flange DIN 25
D50	Flange DIN 50
A10	Flange ANSI 1"
A20	Flange ANSI 2"
W25	Welding pipe DN 25/1" (not option "ET")
W50	Welding pipe DN 50/2" (not option "ET")
XXX	special

Code	Holder Connection
D50	Flange DN 50
A20	Flange ANSI 2"
I25	G 1 1/4" socket (not option "ET")
XXX	special

Code	Flow Direction
18	180°
09	90°

710- - - - < Type No.

CHEMflow 710



CHEMflow

The CHEMflow 710 flow-through vessel is made from stainless steel and is a suitable accessory for the retractable pneumatic holders, such as the CHEMtrac 810 or the CHEMfit 310 static holder. These combinations ensure the optimal position of the sensor in the flow.

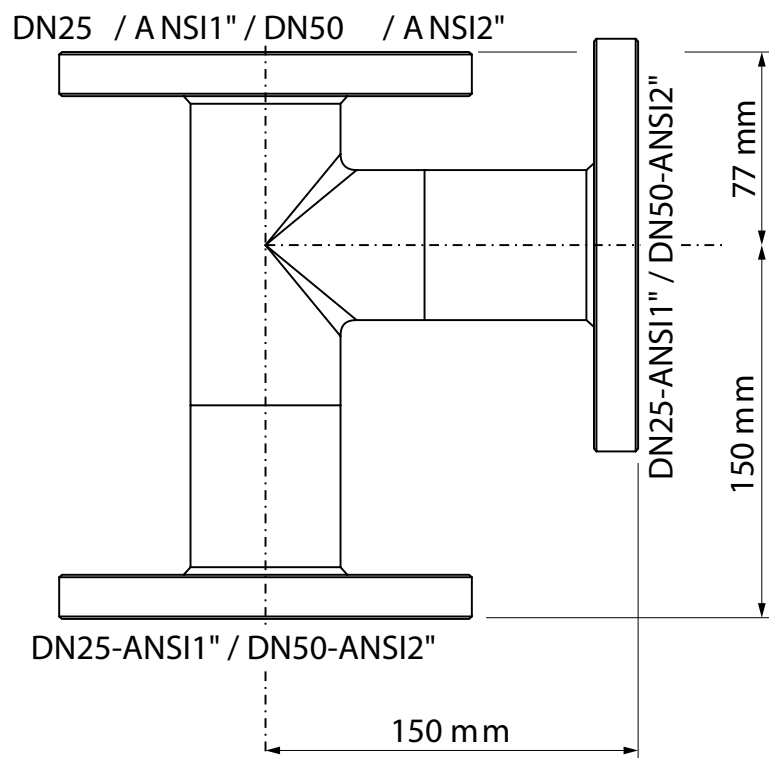
## Applications:

- Inline measurements
- Bypass measurements
- Chemical production
- Water treatment

## Advantages:

- Flexible design
- DN25 / 1" or DN50 / 2"
- 90° or 180° flow direction
- Best sensor position
- Stainless steel AISI 316Ti / 1.4571 or lined with ETFE
- Large selection of process connections
- Up to 16 bar and 140 °C

### CHEMflow 710



# CHEMflow 720

Type configurator:

## Flow Through Vessel CHEMflow 720

Code	Material
PV	PVDF
XX	special

Code	Process Connection
D25	Flange DIN 25
D50	Flange DIN 50
A10	Flange ANSI 1"
A20	Flange ANSI 2"
W25	Welding pipe DN 25/1"
W50	Welding pipe DN 50/2"
XXX	special

Code	Holder Connection
D50	Flange DN 50
A20	Flange ANSI 2"
XXX	special

Code	Flow Direction
18	180°
09	90°

720- - - - < Type No.

CHEMflow 720



CHEMflow

The CHEMflow 720 flow-through vessel is made from plastic and is a suitable accessory for the retractable pneumatic fittings, such as the CHEMtrac 820. This combination ensures the optimal position of the sensor in the flow.

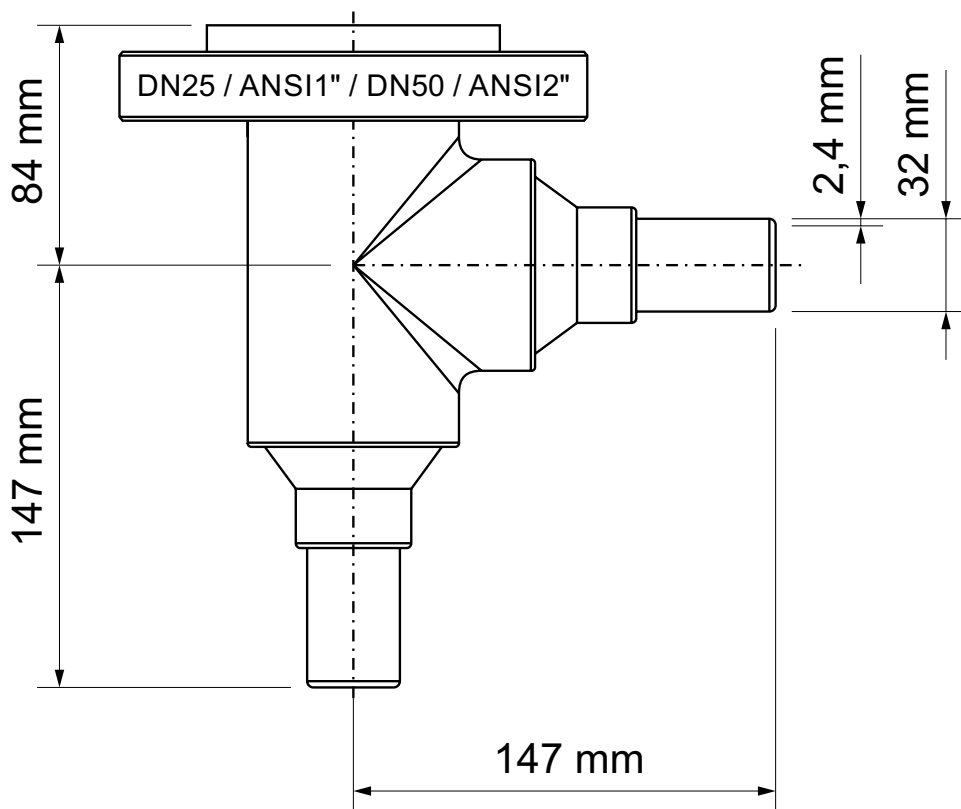
## Applications:

- Inline measurements
- Bypass measurements
- Chemical production
- Water treatment

## Advantages:

- Flexible design
- DN25 / 1" or DN50 / 2"
- 90° or 180° flow direction
- Best sensor position
- PVDF
- Large selection of process connections
- Up to 6 bar and 120 °C

### CHEMflow 720





# 5.1 HandyLab 7series

## New portable pH measuring devices by SI Analytics with MEMOSENS® technology offer increased safety and a user-friendly interface

### MEMOSENS® - superior engineering

When measuring pH, both the sensor and electrical connection to the measuring device are critical for providing quality process data. Traditional analog sensors contain high resistors that require a high-ohm connection to the measuring device. The presence of moisture on the sensor contacts can cause inaccurate readings and even sensor failure. This risk is eliminated by Memosens technology. The measured value is processed in the sensor head, digitalized, and then transmitted to the measuring device without metal contacts; there is no interference.



*MEMOSENS® electrodes  
by SI Analytics*

*HandyLab 780 with  
MEMOSENS® electrode*

## This is how you secure your data

With conventional analog systems the sensor must be calibrated with every replacement. This is due to the calibration data being stored only in the measuring device. The Memosens® concept solves this problem by saving the calibration data in the sensor head. When connected to the measuring device, they automatically identify themselves with their serial number and part number and transmit their calibration data to the measuring device. There is no additional calibration required to ensure an accurate measurement.

*Sensor and PC connections as well as electrode storage.*



- ▶ Increased safety due to digital signal transmission. External interferences are eliminated, calibration data is transferred securely, and sensor data is transmitted easily.
- ▶ The sensor data is stored in the sensor.
- ▶ Predictive maintenance thanks to the possibility to track the sensor's past performance.
- ▶ Submersible thanks to its hermetically sealed plug-in head.
- ▶ MEMOSENS® is an open system, which means that it is supported by several manufacturers and is a defacto standard.

Benefits  
**MEMOSENS®**

# HandyLab 7series

New portable Measuring Devices by SI Analytics



Can be converted into a bench top unit from a mobile unit in mere seconds



Hook for use in the field



Brief functional description on the protective cover

# Selection Table HandyLab 7series

Application	HandyLab 700	HandyLab 750	HandyLab 750EX	HandyLab 780
Memosens® pH and ORP (Redox)	■	■	■	■
Memosens® Conductivity				■
Memosens® Oxygen				■
Analog pH and ORP (Redox)	■	■	■	■
Temperature	■	■	■	■
Ex-Zone 0/1			■	
PC Program HandyLab Pilot		■	■	■
Micro USB-B		■	■	■
Data logger (values)		5,000	5,000	10,000
Li-Ion battery		■		■
Display	LCD segment	LCD segment	LCD segment	QVGA-TFT Color graphic
Multiple languages				■
Help functions				■

## HandyLab 7series - offers increased safety and a user-friendly interface:

- Brings the advantages of digital MEMOSENS® technology, offering increased safety and a user-friendly interface to laboratories, technical colleges, field and process.
- Durable and chemical resistant housing
- Has passed the standardized drop test from 1 m height on cement.
- The HandyLab can be hung up on a hook integrated into the housing.
- By flipping and locking the protective cover these HandyLab devices can be used as bench top units.
- The integrated electrode vessel protects the sensors from drying out or being damaged and is detachable from the housing.
- Simultaneous pH/mV and temperature display
- Can be connected to Memosens® as well as analog sensors.
- Protection class IP 67/ IP 66 (splash water protected NEMA 4X).



# Order information for HandyLab 7series

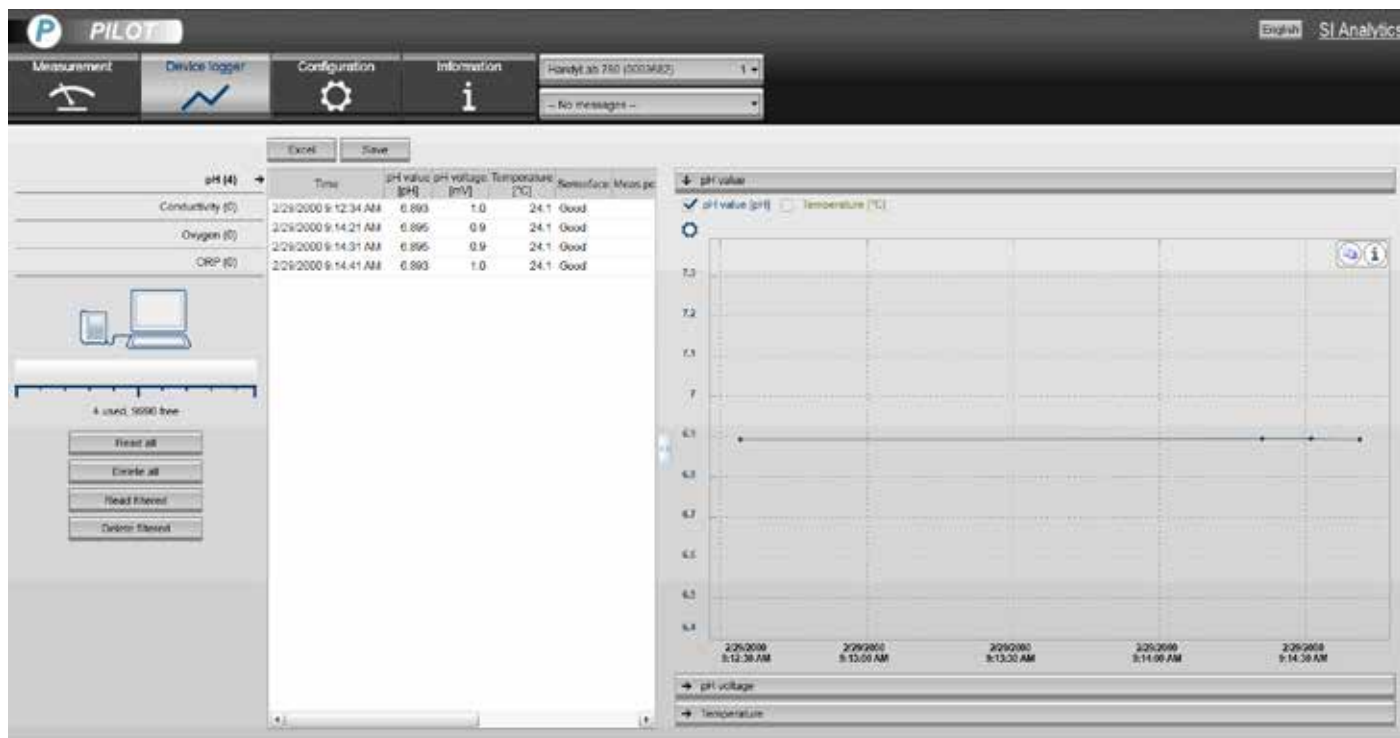
Type No.	Order No.	Description
HL700AL90pH	285205110	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with AquaLine 90 pH, Z544, K1A and DIN buffer solutions in ampoules
HL700N1052A	285205120	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with N1052A and DIN buffer solutions in ampoules
HL700A7781120NMSN	285205130	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with A7781-120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL700H8281120NMSN	285205140	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with H8281-120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL 700-PL83120NMSN	285205150	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with PL83120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL700SL83120NMSN	285205160	Set pH-Meter HandyLab 700 for analog and Memosens® pH electrodes with SL83120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL750AL90pH	285205180	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with AquaLine 90 pH, Z544, K1A and DIN buffer solutions in ampoules
HL750N1052A	285205190	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with N1052A and DIN buffer solutions in ampoules
HL750A7781120NMSN	285205200	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with A7781-120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL750H8281120NMSN	285205210	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with H8281-120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL750PL83120NMSN	285205220	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with PL83120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL750SL83120NMSN	285205230	Set pH-Meter HandyLab 750 for analog and Memosens® pH electrodes with SL83120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in ampoules
HL750EXA7781120NMSN	285205250	Set pH-Meter HandyLab 750 EX for analog and Memosens® pH electrodes with A7781-120 NMSN, Z544, NMSN1M8EX and DIN buffer solutions in ampoules
HL750EXH8281120NMSN	285205260	Set pH-Meter HandyLab 750 EX for analog and Memosens® pH electrodes with J8281-120 NMSN, Z544, NMSN1M8EX and DIN buffer solutions in ampoules
HL750EXPL83120NMSN	285205270	Set pH-Meter HandyLab 750 EX for analog and Memosens® pH electrodes with PL83120 NMSN, Z544, NMSN1M8EX and DIN buffer solutions in ampoules
HL750EXSL83120NMSN	285205280	Set pH-Meter HandyLab 750 EX for analog and Memosens® pH electrodes with SL83120 NMSN, Z544, NMSN1M8EX and DIN buffer solutions in ampoules
HL780AL90pH	285205320	Set pH-Meter HandyLab 780 for analog and Memosens® pH electrodes with AquaLine 90 pH, Z544, K1A and DIN buffer solutions in ampoules
HL780N1052A	285205330	Set pH-Meter HandyLab 780 for analog and Memosens® pH electrodes with N1052A and DIN buffer solutions in ampoules
HL780A7781120NMSN	285205340	Set pH-Meter HandyLab 780 for analog und Memosens® pH electrodes with A7781-120 NMSN, Z544, NMSN1M8 and DIN-buffer solution in ampoules



Type No.	Order No.	Description
HL780H8281120NMSN	285205350	Set pH-Meter HandyLab 780 for analog and Memosens® pH electrodes with H8281-120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in vials
HL780PL83120NMSN	285205360	Set pH-Meter HandyLab 780 for analog and Memosens® pH electrodes with PL83120 NMSN, Z544, NMSN1M8 and DIN buffer solutions in vials
HL780SL83120NMSN	285205370	Set pH-Meter HandyLab 780 for analog and Memosens® pH electrodes with SL83120 NMSN, Z544, NMSN1M8 and DIN buffer solution in vials

## Order information for accessories

Type No.	Order No.	Description
NMSN1M8	285205380	Plug/cable combination 1.5 m for digital sensors with Memosens threaded plug head for HandyLab 7series
NMSN1M8EX	285205290	Plug/cable combination ATEX 1.5 m for digital sensors with Memosens threaded plug head for HandyLab 7series
NMSN3M8EX	285205300	Plug/cable combination ATEX 3 m for digital sensors with Memosens threaded plug head for HandyLab 7series
Z540	285205470	Li-Ion batteries (can only be charged via USB for HandyLab 750 and 780)
Z541	285205480	Sensor case (5 ea.) for the liquid-tight storage for HandyLab 7series
Z542	285205490	Durable field case for storage and transport for HandyLab 7series and sensor
Z543	285205500	Temperature sensor Pt1000 for HandyLab 7series
Z544	285205510	3 adapters for storage of sensors with 12 mm diameter and Pg13.5 thread in the HandyLab 7series case Z541

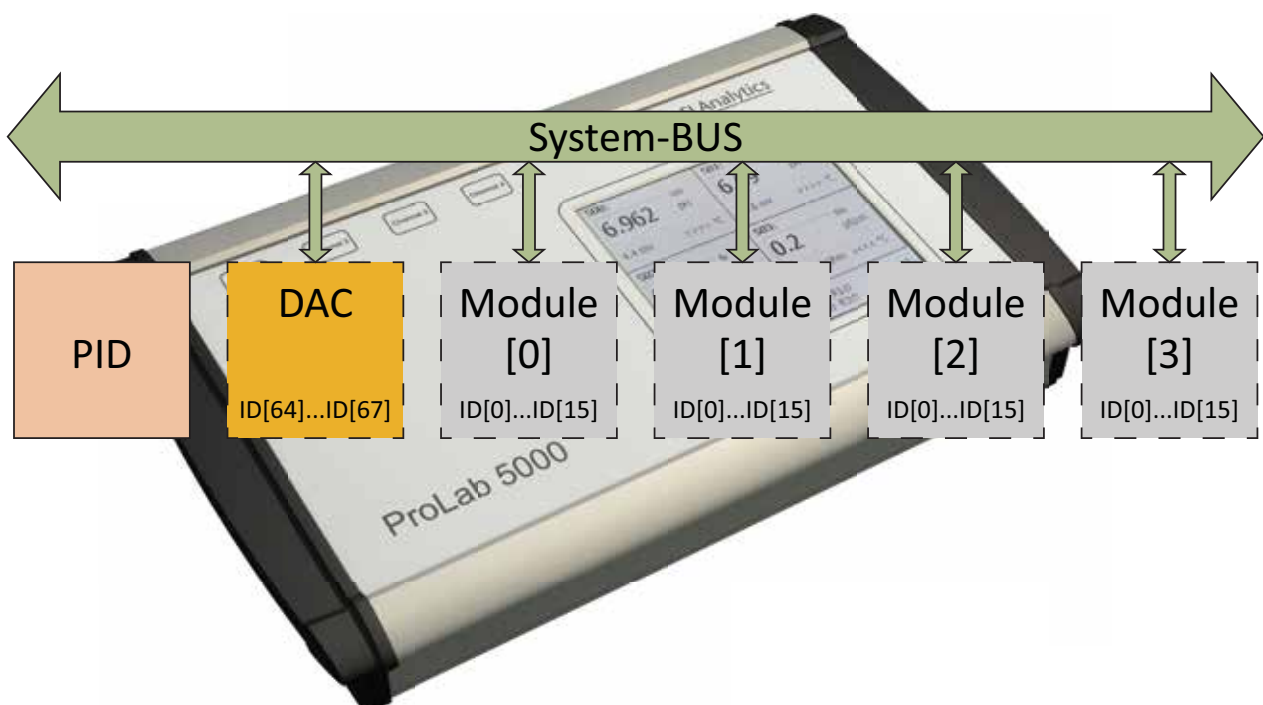


Software interface HandyLabPilot: Intuitive handling - Included with the 750 and up.

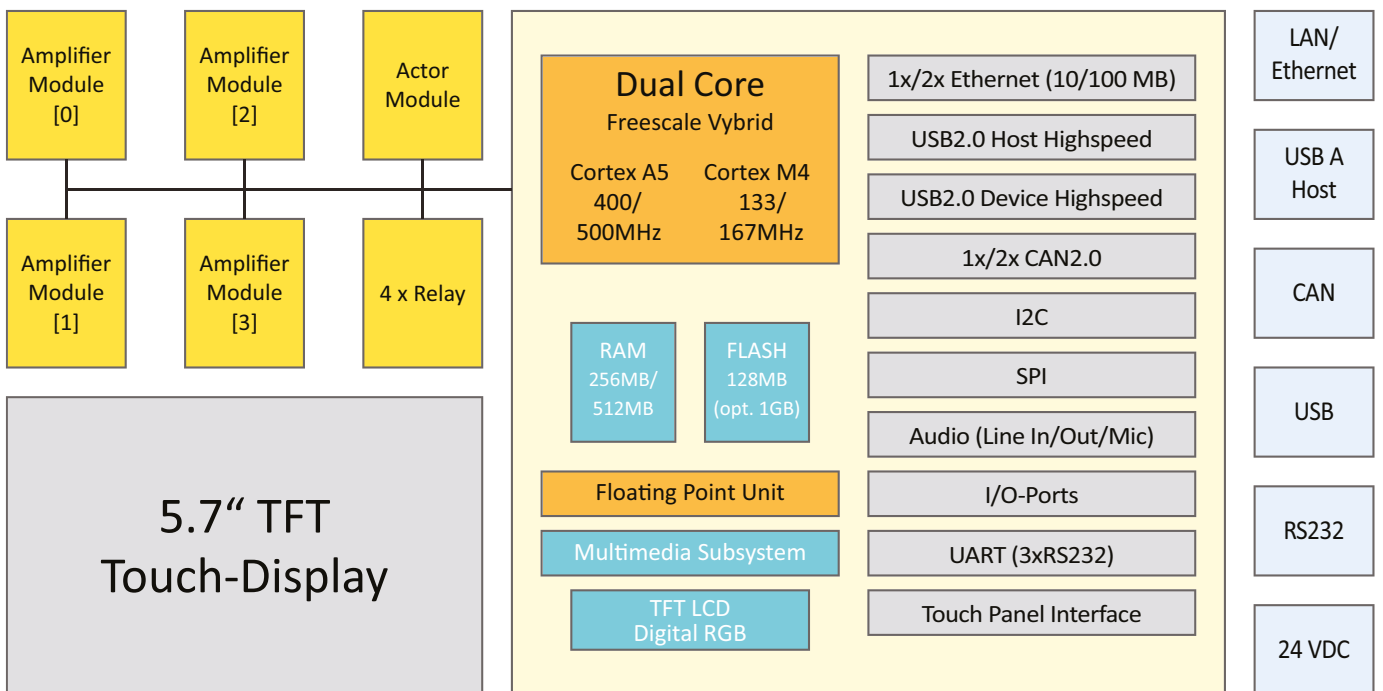
## 5.2 ProLab 5000

### Complete system for measurement, control,

- ▶ Measurement of pH/ISE/mV, conductivity, and dissolved oxygen
- ▶ Up to 4 measurement modules (inputs) in a variety of configurations
- ▶ 5.7" RGB TFT display with touch control
- ▶ PC software with extensive operating functions
- ▶ Coupling of auto-sampler and burettes for dosing and automated measurements
- ▶ Special electrodes for pH
- ▶ Current outputs for each parameter
- ▶ Additional modules for current output possible
- ▶ Timer function
- ▶ Alarm/threshold function
- ▶ 2 PID regulators
- ▶ Virtual channels to calculate different parameters from the measured value
- ▶ Data storage and data recording
- ▶ Data transfer with RS232/USB or Ethernet
- ▶ Logbook (i.e. documentation of setting changes)
- ▶ Access control by password



and regulation of pH, conductivity, and dissolved oxygen in laboratories and technical centers



Meters



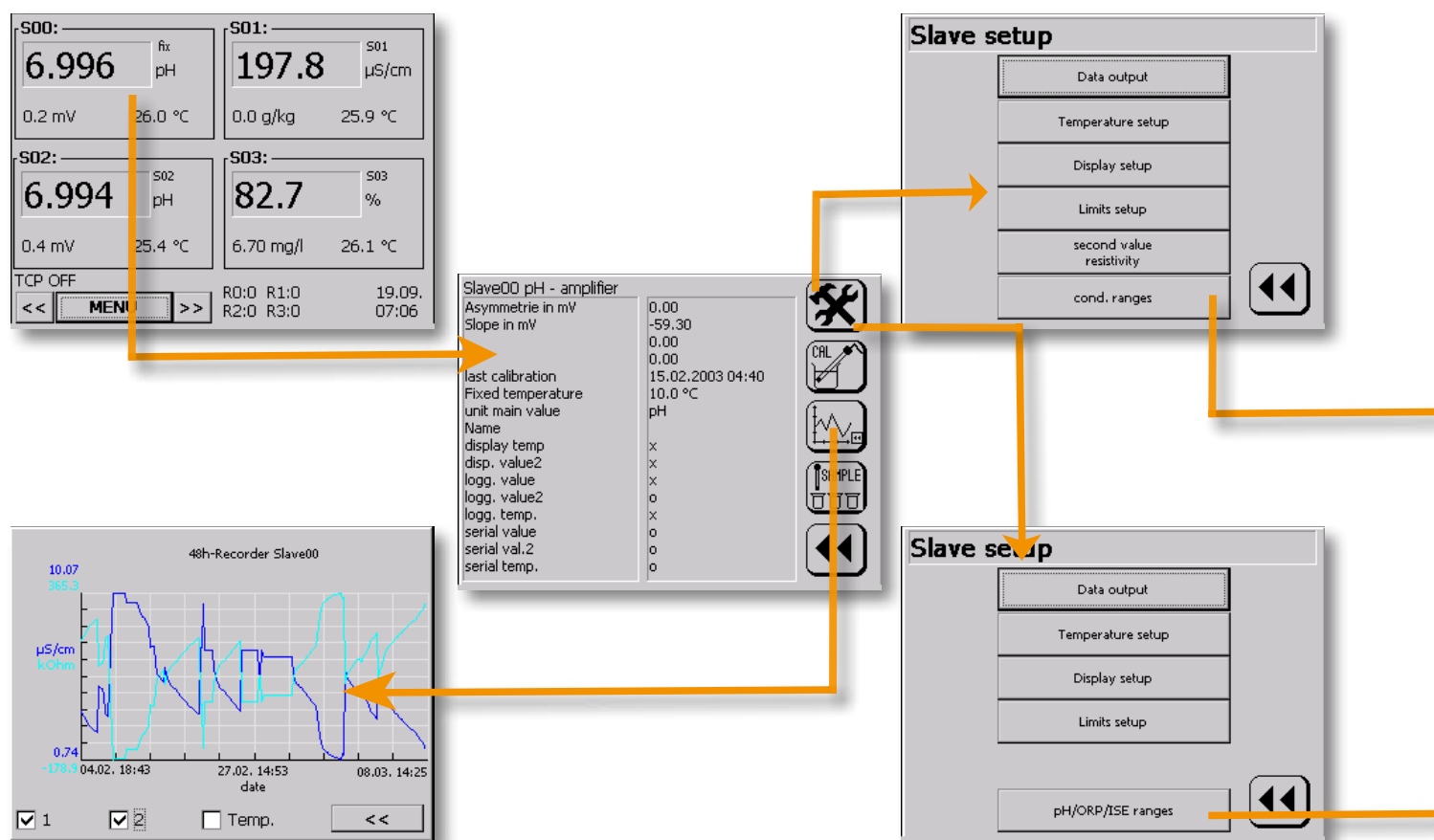
# Components of the ProLab 5000

The ProLab 5000 multiparameter measuring instrument is the complete solution for measurement, control and regulation in the laboratory and technical centers. Up to 4 measurement modules can determine any combination of pH, conductivity, dissolved oxygen, ORP/redox potential, temperature and other parameters. It is based on a modular system structure that links the measurement modules to the central unit and to each other via a bus connection.

The main components of the multiparameter laboratory measurement system ProLab 5000 are:

- ▶ ProLab 5000 with power supply, touch screen display, internal modules, data logger and logbook, various digital interfaces such as RS232, USB and Ethernet
- ▶ PC visualization program
- ▶ Measurement modules
- ▶ Sensors
- ▶ Optional samplers, depending on type, up to 72 samples, for example, TW Alpha plus
- ▶ Optional dosing system (TITRONIC® 500)
- ▶ Optional stirrer

## Setting options



## Multiparameter laboratory measuring instrument ProLab 5000

### Color graphical touchscreen display

The distinguishing outward feature is the color touchscreen graphical display, which significantly simplifies operation, configuration and calibration of the measurement system. Operation is supported by self-explanatory icons. Only the functions, controls and status information that are relevant to the task at hand are displayed. Up to four measured values with their units, their temperature values, a possible second value as well as an individual name can be presented simultaneously on a display page.

### Four integrated threshold relays

Four integrated threshold relays for simple control, regulation or alarm tasks are standard. The assignment of the contacts to the measured values and to the switching values as well as hysteresis can be adjusted by the user. Two PID-regulators that work independently of each other are available for complex regulation tasks. The regulators can be assigned to any parameter and function as analog, pulse width or pulse frequency regulators using the analog current outputs and the relay outputs of the measuring instrument.

### ProLab 5000 Pilot visualization program

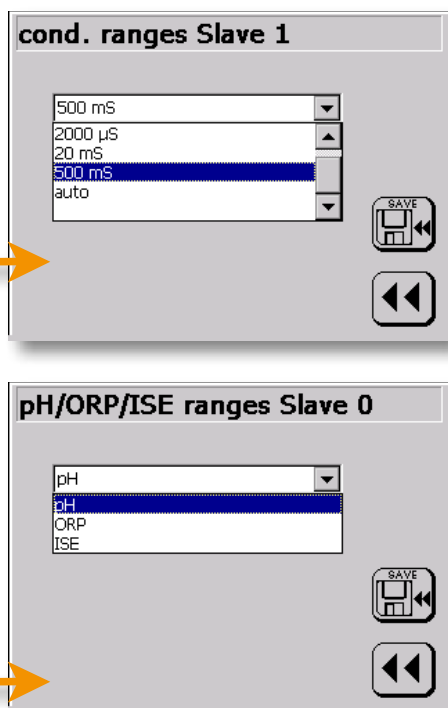
All values can be cyclically output and displayed graphically via the USB interface or Ethernet connected to the PC visualization program ProLab 5000 Pilot. The visualization program ProLab 5000 Pilot simultaneously contains all functions for reading the data logger. The data logger can be used via the USB interface and the data can be transferred directly to a USB stick without the program ProLab 5000 Pilot. The data logger can even be configured as ring storage or finite storage with adjustable sampling time and operates independently of the data output.

### Data recorder

The data recorder graphically displays the measured value curve of the parameters of each measurement module over the past 48 hours on the touch screen. This representation gives the operator a quick overview of the measurement progress, indicating the average, maximum and minimum.

### Software update

Upgrading the device software through an update represents a great advantage. This can be stored on a USB stick and then transferred via an update function in the device. Thus, the user is able to quickly perform software upgrades himself.



# Ordering information - ProLab 5000

Type No.	Order No.	Product hierarchy No.	Description
PL5000 0D 1pH 0LF 0OX	285206010	07	Multiparameter measuring instrument ProLab 5000 with one pH/mV/ISE-module
PL5000 0D 1pH 1LF 0OX	285206020	07	Multiparameter measuring instrument ProLab 5000 with each one pH/mV/ISE- and conductivity-module
PL5000 0D 1pH 1LF 1OX	285206030	07	Multiparameter measuring instrument ProLab 5000 with each one pH/mV/ISE-, conductivity- and dissolved oxygen-module
PL5000 0D 1pH 2LF 1OX	285206040	07	Multiparameter measuring instrument ProLab 5000 with each one pH/mV/ISE- and dissolved oxygen- as well as two conductivity-modules
PL5000 0D 2pH 0LF 0OX	285206050	07	Multiparameter measuring instrument ProLab 5000 with two pH/mV/ISE-modules
PL5000 0D 2pH 1LF 0OX	285206060	07	Multiparameter measuring instrument ProLab 5000 with two pH/mV/ISE- and one conductivity-modules
PL5000 0D 2pH 2LF 0OX	285206070	07	Multiparameter measuring instrument ProLab 5000 with each two pH/mV/ISE- and conductivity-modules
PL5000 0D 2pH 1LF 1OX	285206080	07	Multiparameter measuring instrument ProLab 5000 with each one conductivity-, dissolved oxygen- and two pH/mV/ISE-modules
PL5000 0D 3pH 0LF 0OX	285206090	07	Multiparameter measuring instrument ProLab 5000 with three pH/mV/ISE-modules
PL5000 0D 3pH 1LF 0OX	285206100	07	Multiparameter measuring instrument ProLab 5000 with three pH/mV/ISE- and one conductivity-modules
PL5000 0D 3pH 0LF 1OX	285206110	07	Multiparameter measuring instrument ProLab 5000 with three pH/mV/ISE- and one dissolved oxygen-modules
PL5000 0D 4pH 0LF 0OX	285206120	07	Multiparameter measuring instrument ProLab 5000 with four pH/mV/ISE-modules
PL5000 1D 1pH 0LF 0OX	285206130	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter and one pH/mV/ISE-module
PL5000 1D 1pH 1LF 0OX	285206140	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter as well as each one pH/mV/ISE- and conductivity-module
PL5000 1D 1pH 1LF 1OX	285206150	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter as well as each one pH/mV/ISE-, conductivity- and dissolved oxygen-module
PL5000 1D 1pH 2LF 1OX	285206160	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter as well as each one pH/mV/ISE-, dissolved oxygen- and two conductivity-modules
PL5000 1D 2pH 0LF 0OX	285206170	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter and two pH/mV/ISE-modules
PL5000 1D 2pH 1LF 0OX	285206180	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter, two pH/mV/ISE- and one conductivity-modules
PL5000 1D 2pH 2LF 0OX	285206190	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter, each two pH/mV/ISE- and conductivity-modules
PL5000 1D 2pH 1LF 1OX	285206200	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter, each one conductivity- and dissolved oxygen- as well as two pH/mV/ISE-modules
PL5000 1D 3pH 0LF 0OX	285206210	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter and three pH/mV/ISE-modules
PL5000 1D 3pH 1LF 0OX	285206220	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter, three pH/mV/ISE- and one conductivity-modules
PL5000 1D 3pH 0LF 1OX	285206230	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter, three pH/mV/ISE- and one dissolved oxygen-modules
PL5000 1D 4pH 0LF 0OX	285206240	07	Multiparameter measuring instrument ProLab 5000 with digital-analog-converter and four pH/mV/ISE-modules
Z570	285206250	04	USB cable for ProLab 5000
Z573	285206260	04	Cable for connecting the ProLab 5000 to sample changer
Z575	285206270	04	Wall fix for installing ProLab 5000

pH/mV/ISE	Number of modules		
	Cond	D.O.	Digital-Analog Converter

1 0 0 0

1 1 0 0

1 1 1 0

1 0 0 0

2 2 1 0

2 1 0 0

2 2 0 0

2 1 1 0

3 0 0 0

3 1 0 0

3 0 1 0

4 0 0 0

1 0 0 1

1 1 0 0

1 1 1 1

1 2 1 1

2 0 0 1

2 1 0 1

2 2 0 1

2 1 1 1

3 0 0 1

3 1 0 1

3 0 1 1

4 0 0 1

Channel 4  
1

SI Analytics



Meters



## 6.1 Innovative electrochemistry and innovative viscometry – from the very beginning



*Thorough quality control is an essential element from start to finish. The zero point and response time of every electrode is checked – as shown here with a batch of BlueLine laboratory electrodes.*



*Even today glass blowing talent is still indispensable.*

The success story of electrochemical measurement began around 80 years ago with the development of the glass electrode at SCHOTT®.

It is hard to imagine – but in 1936 SCHOTT® revolutionized the field of chemical measurements with a glass electrode that looks more like a glass bulb. Glass electrodes made from the newly created, electrically conductive pH glass were developed at the Jenaer Glaswerk SCHOTT® & Gen., making it possible to

achieve “sufficient accuracy” for pH measurements “with conventional pointer-type galvanometers”.

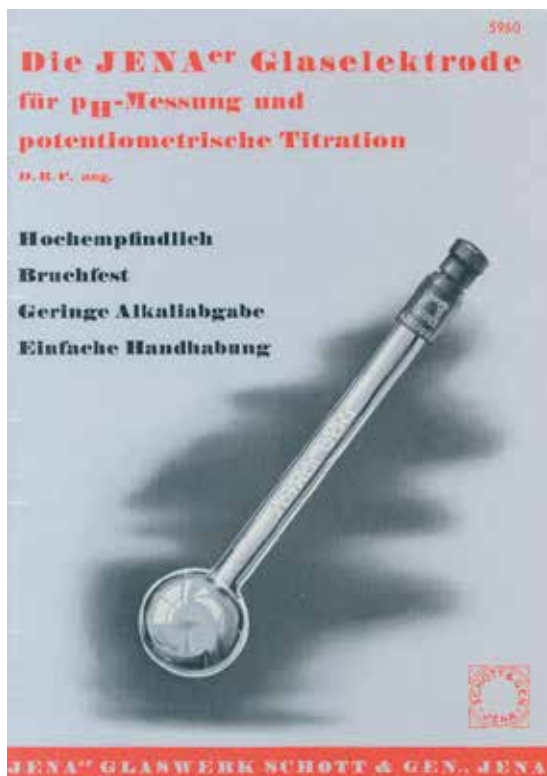
In 1938 our first brochure described how this was achieved. The development was based on the experience which we had gained from close cooperation with pioneer users in the industry.

Glass know-how was also the idea behind another measurement process that we pioneered in 1940: capillary viscometry. With precisely calibrated glass capillaries it was possible to determine the viscosity of Newtonian liquids more accurately than with any other method known at that time. You needed to measure the time required for a liquid sample to flow through a calibrated capillary with a defined constant. Then the required time was measured manually with a stop-watch. Today that works more easily and more precisely.

The success story of our meters began in the 1970s. In addition to our pH electrodes and viscometers, advances in the field of microelectronics in the seventies paved the way for the development of our first instruments.

To enable us to react faster and be more flexible to our customer needs SCHOTT® Geräte GmbH was established in 1973 as a separate company. Our newly developed instruments – such as laboratory meters, pH meters and the automatic viscosity measurement system AVS® – caused a sensation and rapidly conquered their respective markets.

Our first microprocessor-controlled piston burette and our titration systems were a small sensation in the industry. Our lower cost, portable, pocket-size pH meters and conductivity meters were an instant success. In 1988, SCHOTT-Geräte presented the first PC-controlled titration system.



*The new measurement method had to be explained: in 1938 we published our first instructions for electrochemical pH measurement and potentiometric titration.*



*With the processed calibration, the viscometers are provided with an ID number and a certificate documenting the specific characteristics.*



*Everything O.K. A batch of TitroLine® interchangeable units after volume inspection.*

Our innovative AVS® products have also made life much easier for our customers who need to measure viscosity. Examples include the practical ViscoClock, the AVS®Pro II, an apparatus for automatic viscosity measurements that is top-of-the-line worldwide, or the modular measurement systems AVS® 370 and AVS® 470. We also have set new standards for top-of-the-line equipment with the TitroLine® 6000/7000 titrator, the TITRONIC® 500 piston burette and the new KF titrators TitroLine® 7500 KF, TitroLine® 7500 KF trace. and TitroLine® 7800

#### From SCHOTT® to Xylem

In 2003 SCHOTT® Geräte GmbH became SCHOTT® Instruments GmbH and part of Nova Analytics. The location including development and production remained in Mainz. In 2009 SCHOTT® Instruments became SI Analytics. In 2010 Nova Analytics was acquired by ITT and was integrated into the company as ITT Analytics. The fluidtechnology part of ITT to which SI Analytics belonged became the stand-alone company Xylem Inc. Xylem is headquartered in White Plains, N.Y., USA and is a

leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings. The company does business in more than 150 countries through a number of market-leading product brands with 2014 annual revenues of \$3.9 billion and 12,500 employees worldwide.

#### Nearly 80 years of research and development and a long-standing tradition

The list of our innovations is long: today our electrodes are smaller, more precise, faster and more stable; our equipment offers higher performance.

Since our pioneering days, one thing has invariably remained the same - our tradition of working very closely together with those who use our products in order to create something new.

*A customer satisfaction center. In our application laboratory, for example, new methods can be developed for our customers or the suitability of existing methods for new applications can be tested.*



## 6.2 We are Xylem Analytics

Xylem consists of three business sectors - Water Solutions, Applied Water Systems and Analytics. The following companies make up Xylem Analytics and act like SI Analytics in the chemical, pharmaceutical, biotechnological, food and plastics industries.

### **Bellingham & Stanley**

For almost a century, Bellingham + Stanley has been the leader in the field of:

- Refractometers
- Polarimeters
- Certified Reference Materials

**[www.bellinghamandstanley.com](http://www.bellinghamandstanley.com)**



a xylem brand

### **SI Analytics**

We have risen from the history of SCHOTT® AG. SI Analytics can offer nearly 80 years of experience in glass technology and the development of analysis equipment. We will continue to develop and manufacture our products with the highest requirements of innovation and quality. We continue to value tradition and manufacture in the footsteps of traditional Mainz glass manufacturers.

Our products include:

- Electrodes
- Meters
- Titrators
- Capillary viscosimeters

**[www.si-analytics.com](http://www.si-analytics.com)**

### SI Analytics

a xylem brand

## ebro

ebro has been servicing the scientific world with innovative temperature measurement solutions for over forty years and today,

customer feedback still plays an important role within the business model.

To ebro, customer care not only means supporting existing product

and software; it also means being able to provide custom solutions

within their field of excellence too!

- Precision thermometers
- Food Safety test kits
- Frying oil monitors
- Humidity, vacuum & temperature dataloggers
- Portable digital refractometers

**[www.ebro.com](http://www.ebro.com)**



## OI Analytical

Since 1963 OI Analytical has been providing innovative products

used for chemical analysis and is a key supplier of sample preparation and turn-key analytical solutions for testing food

products and water for chemical contaminants.

Beverage & water analyses include the determination of:

- Total Organic Carbon (TOC) & cyanide
- Organophosphorus & organochlorine pesticides
- Volatile Organic Compounds (VOCs)

Sample preparation for food and fruit analyses include:

- Antibiotics & mycotoxins
- Organophosphorus pesticides
- Organochlorine pesticides

**[www.oico.com](http://www.oico.com)**



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Furthermore, Xylem Analytics comprises:





## 6.3 A brief excerpt from our company's history

Since 1936 - New products consistently from research and development

- 1936 Development and production of pH glass electrodes at Jenaer Glaswerk SCHOTT® & Gen. in Jena.
- 1940 Beginning of viscometer production using capillaries that were manufactured in accordance with the calibrated precision glass method that SCHOTT® had developed.
- 1952 Development and production of the first gel-filled, low-maintenance reference electrodes.
- 1962 The unique platinum diaphragm makes substantially faster response times possible.
- 1964 Double electrolyte system for reference electrodes.
- 1970 Introduction of semiconductor preamplifiers for pH measurement technology.
- 1972 Buffer solutions in double-pointed ampules sterilized with superheated steam guarantee reliable calibration - even after several years in storage.
- S6 and S7 plug system from SCHOTT®, copied time and again.
- 1973 SCHOTT® Geräte GmbH established as an independent company.
- Beginning of viscometer calibration using PTB tested reference measurement standards. (German Physical Technical Institute).
- 1974 Development and production of electronic laboratory pH meters.
- 1975 Market launch of the first automatic viscosity measurement apparatus for aggressive and corrosive solvents (AVS®/G and AVS®/PA).
- 1977 Development and production of portable electronic pH meters.
- 1978 The first titration control unit TR 155 and the T 100 piston burette with interchange unit.
- 1982 The first microprocessor-controlled viscosity measurement apparatus (AVS® 300).
- 1983 Development of the new Type S pH glass for hot alkaline solutions with extraordinarily high reliability and useful life, and Type H pH glass, robust and minimal alkali error.
- 1984 Combination measurement and reference pH electrode with integrated Pt 1000 as temperature sensor.
- SCHOTT® Geräte presents the first thermal scanning method for viscosity measurement.
  - The first stand-alone viscosity measurement apparatus with integrated computing function (AVS® 400 and AVS® 440) are introduced to the market.
  - Compact T 80/T 90 piston burettes and simple control unit TR 85.
- 1988 Presented the first PC-controlled titration system TPC 2000 at the Achema 1988.
- 1989 With the AVS® 500, the tradition of successful automatic samplers for determination of the viscosity of aggressive polymer solutions was continued.
- 1990 REFERID® electrodes with polymer electrolyte, low-maintenance.
- 1991 Low-impedance Type L pH glass for low temperatures and ultrapure water.
- Automatic sampler TW 280.
- 1992 TT electrodes, capable of withstanding up to -60 °C.
- T 200 and T 110 piston burettes and universal titration control unit TC 1200.
- 1993 Combination pH electrodes with temperature sensor and plastic shaft.
- 1994 Compact TitroLine® alpha titrator.
- 1995 SILAMID®, stable reference system.
- First Windows titration software TitrSoft 1.0 (WIN 3.1).
- 1996 New SMEK shielded 6-pin plug system.

View over Mainz location of  
SI Analytics/SCHOTT® AG

Source of image: SCHOTT® AG



- 1997 New BlueLine range of laboratory electrodes and VP plug system.
  - Electrodes with certified pressure and temperature range.
  - Market launch of the Visco-Clock for capillary viscosity measurement.
- 1998 Development of TitrSoft 2.0 software (as of WIN 95).
- 1999 Range of industrial electrodes up to 10 bar and 135 °C, SMEK plug system in IP 68 version.
  - New Type A pH glass, rapid reaction in drinking water.
  - Market launch of the fully automatic AVS®Pro viscosity measurement system for high sample throughput.
- 2000 Introduction of a completely new series of compact, simple piston burettes and titrators: TITRONIC® *basic*, TITRONIC® *universal* and TitroLine® *easy*.
  - Introduction of the Karl Fischer titration system TitroLine® *KF*.
- 2001 Development and production of SteamLine process electrodes for CIP and SIP applications in the pharmaceutical, food and chemical sectors.
- 2002 Sales launch of newly developed "plus" product line: TitroLine® *alpha plus*, T 110 *plus*.
  - Introduction of TW alpha plus sample changer.
  - Market launch of TitrSoft 2.5 software.
- 2003 The compact and highly flexible AVS® 370 viscosity measurement system is presented to the market.
  - Change of company name to SCHOTT® Instruments GmbH, Mainz, integration into the internationally active Nova Analytics Group.
- 2004 Amalgamation and further development of the laboratory electrode product range for the most exacting requirements in the "ScienceLine" product line.
  - The new generation of automatic viscosity measurement systems is rounded off with the AVS® 470.
- 2005 The Lab meters family is introduced:
  - A wireless sensor recognition guarantees the optimum communication between electrode and meter.
- 2006 Introduction of the ProLab family of instruments: Multi-functional measuring instruments with integrated user recognition guarantee utmost flexibility and reliability of measurement.
- 2007 ProLab 3000 and 4000 high-end laboratory instruments signify the cutting-edge standard for pH/ionic and conductivity measuring and for the first time combine highest measuring quality with functionality, also providing a user-friendly navigation comparable to a Windows PC.
  - The new Karl Fischer titrator, TitroLine® *KF trace* from SCHOTT® Instruments, also offers a coulometric technique for determining even smallest water content.
- 2008 The new IoLine electrodes with their patented iodine/iodid three-chambers reference system represent the perfect solution for accomplishing the ultimate challenging measuring tasks in i.e. pharmacy, biotechnology and food industry.
- 2009 SCHOTT® Instruments GmbH becomes SI Analytics GmbH.
- 2010 SI Analytics becomes part of ITT, USA.
- 2011 The new titrators TitroLine® 6000/7000 and the new Piston burette TITRONIC® are introduced.
  - The fluidtechnology part of the ITT group SI Analytics belongs to, becomes a stand-alone stock traded company named Xylem Inc.
- 2012 The new titrator series TitroLine® was supplemented by the new KF titrators TitroLine® 7500 *KF* (volumetric) and TitroLine® 7500 *KF trace* (coulometric).
  - Introduction of Memosens® elektrodes for contactless connection to measurement devices.
- 2013 Manual armatures CHEMtrac are introduced.
- 2014 The new handheld devices MKII and HandyLab 7series are available.
- 2015 The new developed ProLab 5000, designed for process applications, is being launched.
  - TitroLine® 5000 and TITRONIC® 300 are replacing TitroLine® *easy* and the burette TITRONIC® *universal/easy*.
  - The new TitroLine® 7800 with the possibility to connect pH and LF sensors at the same time is released.
  - The certification of ISO 14001/18001 has been performed successfully.



## Xylem | 'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

**For more information on how Xylem can help you, go to [www.xyleminc.com](http://www.xyleminc.com)**

**SI Analytics**  
a **xylem** brand

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