



OPTISENS PAS 1000

Technical Datasheet

pH and ORP Electrodes

- High quality and precise glass electrodes of the OPTISENS PAS 1000 range for usage in water analysis
- Different designs for optimum adaptation to the corresponding application
- Low maintenance costs and a long life cycle

High Quality and Precise Glass Electrodes for Usage in Water Analysis

The **OPTISENS 1000** pH and ORP electrode range is characterized by standardised designs, easy handling and a long life cycle. In combination with a **OPTISENS 050** converter, it is possible to create extremely reliable and low-cost measurement systems, which are suitable for a wide range of water analysis measurement tasks. Designed as combined electrodes with built-in reference electrode and available with different diaphragm materials, the **PAS 1000** electrodes can be ideally adapted to the application thus also making these electrodes extremely service friendly and durable.



- ❶ Process connection PG 13.5
- ❷ Glass shaft with built-in reference electrode and KCL gel filling
- ❸ Teflon diaphragm
- ❹ Glass membrane made of AH glass



- ❶ Process connection PG 13.5
- ❷ Glass shaft with built-in reference electrode and KCL gel filling
- ❸ Platinum electrode

Highlights

- Suitable for connection to the OPTISENS®050 converter
- Membranes made of highly sensitive special glass (pH)
- Ring electrodes made of ultrapure, solid platinum (ORP)
- Various diaphragm materials
- Design as combined electrode with built-in reference electrode
- Standardised design and connections
- Optional: built-in temperature sensor

Industries

- Water industry
- Power plants
- Food & Beverages
- Metal industry and mining
- Paper industry
- Chemicals

Applications

- Generally in all water applications
- Monitoring and control of water neutralisation processes/disinfection
- Quality control of water (including steam and cooling water)
- Process control
- Dosage of flocculation agents

Options and variants



OPTISENS 1000 pH electrodes

The membranes in the **OPTISENS 1000 pH electrodes** are manufactured using highly sensitive special glass which can be used in almost all standard water applications due to its wide temperature range. Moreover, different diaphragm materials (PTFE, ceramic) and different equipments are available such as a built-in temperature sensor (Pt100). Special versions for other measurement ranges or special operating conditions are available on request.

Available OPTISENS 1000 pH electrodes:

- PAS 1000 pH combined electrode with ceramic diaphragm
- PAS 1000 pH combined electrode with Teflon diaphragm
- PAS 1000 pH combined electrode including Pt100



OPTISENS 1000 ORP electrodes

The ring electrodes in the **OPTISENS 1000 ORP sensors** are made of ultrapure platinum and are directly attached to the glass shaft of the sensor using a special process. In addition to excellent measurement accuracy, this leads to a high chemical and mechanical resistance of the electrode and therefore to a long service life with stable measurement performance.



OPTISENS 1000 assemblies

As a complete provider for water analysis, Krohne naturally offers a complete range of assemblies. As such, in addition to immersion assemblies, there is also a range of flow-through assemblies and adapters for process connections in a wide variety of materials.

Special versions for special operating conditions are available on request.

For the PAS 1000 electrodes the following individual assemblies are available

- MAA 1000 flow-through assembly pH/ORP/oxygen DN25 PP
- MAA 1000 immersion assembly pH/ORP/oxygen
- MAA 1000 screw-in adapter pH/ORP/oxygen G 1¼"
- MAA 1000 screw-in adapter pH/ORP/oxygen MNPT SS



OPTISENS 1000 accessories and spare parts

In addition to the versatile MAA 1000 assemblies, the **OPTISENS 1000 series** also offers a comprehensive range of accessories and spare parts.

Technical data

Measuring system

Measuring principle	Potentiometric measuring principle
Application range	Continuous measurement of pH and ORP in fluids
Modular design	A typical pH/ORP measuring point is comprised of:
	- OPTISENS PAC 050 converter
	- OPTISENS PAS 1000 electrode
	- OPTISENS 1000 connection cable
	- OPTISENS 1000 assembly

PAS 1000 ORP electrode

Design

Type	Glass shaft with diameter 12 mm / 0.47"; length 120 mm / 4.72"; with PG 13.5 screw connection
Equipment	Ceramic diaphragm, Pt electrode
Measuring range	-1500...1500 mV

Operating conditions

Temperature range	10...+70°C / 50...158°F
Max. operating pressure	2 bar / 30 psi
Minimum conductivity	> 150 µS/cm

Installation conditions

Immersed installation	OPTISENS MAA 1000 immersion assembly
Inline installation	OPTISENS MAA 1000 flow through holder DN25 PP
Process connection G 1 ¼"	OPTISENS MAA 1000 screw-in adapter G 1 ¼" SS
Process connection ¾" MNPT	OPTISENS MAA 1000 screw-in adapter MNPT SS

Materials

Electrode shaft	Glass
Measuring electrode	Platinum
Reference system	Ag/AgCL/KCL gel (TEPOX)
Diaphragm	Sintered ceramics, ø 2 mm
Gasket	EPDM

Electrical connection

Connector	2-pole DIN-KOAX plug-in head, IP68
Cable	PAW 1000 KOAX
Length	5 m / 16.4 ft or 10 m / 32.8 ft

PAS 1000 pH electrodes

	PAS 1000 pH, ceramic	PAS 1000 pH, PTFE	PAS 1000 pH, annular-gap diaphragm with Pt100
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Design

Type	Glass electrode 12 mm / 0.47" shaft diameter; length 120 mm / 4.72"; with PG 13.5 screwed connection		Glass electrode 12 mm / 0,47" shaft diameter; length 120 mm / 4.72"; with PG 13.5 screwed connection and VP plug-in head
Equipment	Ceramic diaphragm	Teflon diaphragm	2 annular-gap diaphragms; Pt100
Measuring range	0...14 pH	0...14 pH	0...14 pH

Operating conditions

Temperature range	-5...+70°C / 23...158°F	-5...+70°C / 23...158°F	0...130°C / 32...266°F
Max. operating pressure	2 bar / 30 psi	16 bar / 232 psi	6 bar / 87 psi
Minimum conductivity	> 150 µS/cm	> 150 µS/cm	> 2 µS/cm

Installation conditions

Process connection	PG 13.5
Immersed installation	MAA 1000 immersion holder
Inline installation	MAA 1000 flow-through holder DN25 PP
Process connection G 1 ¼"	MAA 1000 screw-in adapter G 1¼" SS
Process connection ¾" MNPT	MAA 1000 screw-in adapter MNPT SS

Materials

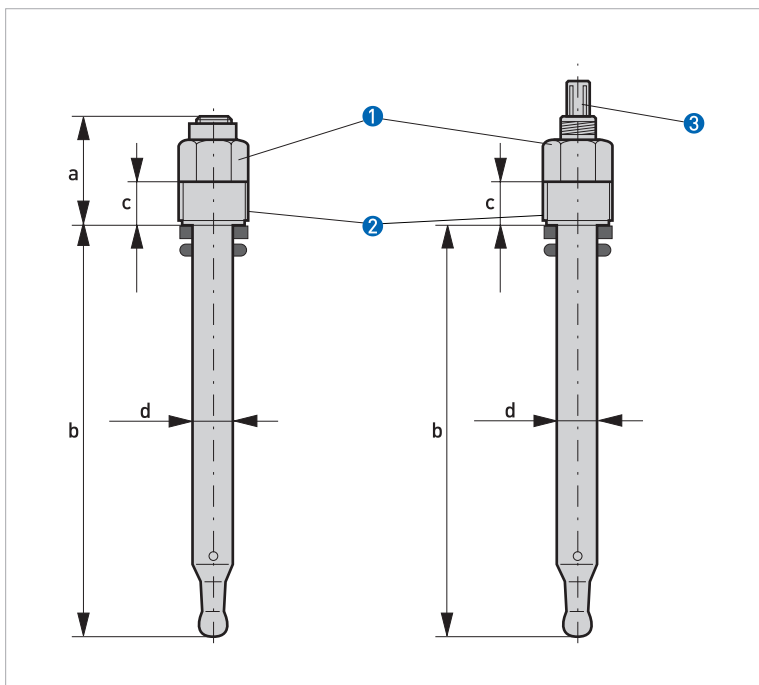
Electrode shaft	Glass	Glass	Glass
Measuring electrode	AH glass	AH glass	H glass
Inside buffer	pH 7.0	pH 7.0	pH 7.0
Reference electrolyte	KCL gel	KCL gel	KCL gel
Diaphragm	Sintered ceramics, 2 mm / 0.08"	PTFE	Annular-gap diaphragm
Gasket	EPDM	EPDM	EPDM

Electrical connection

Connector	2-pole DIN-KOAX plug-in head	VP plug-in head
Cable	PAW 1000 KOAX	PAW 1000 VP
Cable design	DIN Koax connector core end sleeves	VarioPin connector core end sleeves
Cable length	5 m / 16.4 ft or 10 m / 32.8 ft	

Dimensions

pH combined electrode

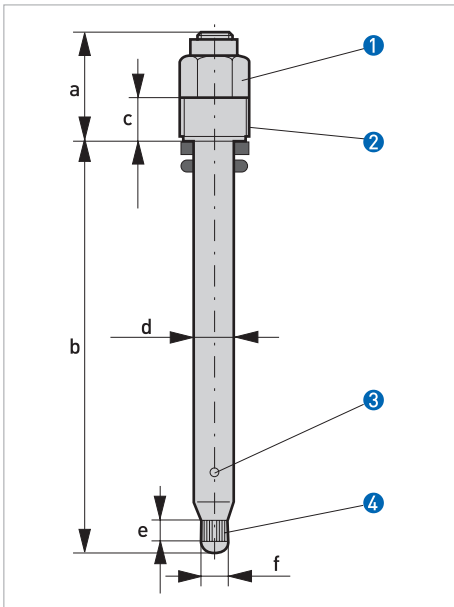


- ❶ WS 17
- ❷ PG 13.5
- ❸ VP plug-in head

	Dimensions [mm]	Dimensions [inch]
a ❶	31	1.2
b	120	4.7
c	12	0.5
d	Ø 12	Ø 0.5

- ❶ VP plug-in head deviating in dimension a

ORP combined electrode



- 1 WS 17
- 2 PG 13.5
- 3 Diaphragm
- 4 Pt ring

	Dimensions [mm]	Dimensions [inch]
a	31	1.2
b	120	4.7
c	12	0.5
d	Ø 12	Ø 0.5
e	6	0.2
f	Ø 8	Ø 0.3

Ordering code

VGA B	4	Sensor	0	none
			1	OPTISENS PAS 1000 pH
			2	OPTISENS PAS 1000 pH Temp
			3	OPTISENS PAS 1000 ORP/Redox
		Measuring Range	0	none
			1	0 ... 14 pH
			2	0 ... 14 pH and 0 ... 110 °C Temp
			6	-1500 ... +1500 mV ORP/Redox
		Sensor features	0	none
			1	Ceramic Diaphragm
			2	PTFE Diaphragm (not PAS 1000 ORP)
			3	Annular-Gap Diaphragm (PAS 1000 Temp)
		Process Conditions	0	none
			1	5 ... 70 °C, 16 bar (PTFE)
			2	5 ... 70 °C, 2 bar (Keramik)
			6	10 ... 70 °C, 2 bar (PAS 1000 ORP/Redox)
			7	0 ... 130 °C, 6 bar (PAS 1000 Temp)
		Process Connection	0	ohne
			1	PG 13,5
		Sensor Options	0	none
			1	Standard
		Sensor-Cable connection	0	none
			1	DIN Koax (PAS 1000 pH, ORP)
			2	Variopin (PAS 1000 pH mit Temp)
		Cable	0	none
			A	PAW 1000
		Cable Features	0	none
			1	Standard
			2	with 3-wire temperature cable
		Cable length	0	none
			2	5 m (16,5 ft.)
			4	10 m (33 ft.)
		Cable Options	0	none
			1	Terminal Ends
		Documentation	0	none
			1	English
			2	German
VGA B	4			Order code





KROHNE measuring technology - Product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Temperature measuring instruments
- Pressure measuring instruments
- Analysis
- Oil and gas industry

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