pyroscience
sensor technology

Specifications
pH Sensors

1 PH SENSOR SPECIFICATIONS

Only valid in physiological solutions (ionic strength = 150mM) at 25°C for 2-point calibrated sensors. Specifications are valid for pH sensor spots (item no.: **PHSP5-PKx**), self-adhesive sensor spots (item no.: **PHSP5-PKx-ADH**), sterilized self-adhesive sensor spots (item no.: **PHSP5-PK7-ADH-STER**), pH sensor of pH sensor vials (item no.: **PHTOVIAL20-PKx**), robust screw cap probes (item no.: **PHROBSC-PKx**), including underwater versions (option -**SUB**) and pH cap probes (item no.: **PHCAP-PKx(-AF)-SUB**).

1.1 General Characteristics

Response Time (t_{90}) at 25°C[1] **-PK5, -PK8(T), -PK8(T)-AF-SUB** **-PK6, -PK7, -PK7-ADH-STER** **-PK7-AF-SUB**	 <60 sec <100 sec <120 sec
Temperature Range	-1°C (30°F) to 50°C (122°F)
Influence of Salinity[2]	Specified for measurements between 20-500 mM ionic strength (approx. 1-30 PSU). Exception: **PK8T** sensors are only specified between 20 and 40 PSU. Response time and accuracy at lower or higher salinities are not specified. Rough compensation is enabled in the software.
Influence of Hydrostatic Pressure	ca. + 0.029 pH/100 bar hydrostatic pressure
Calibration Modes	1-point calibration or 2-point calibration (recommended), pre-calibration mode[3]
Calibration Solution	PyroScience buffer capsules or a self-made buffer (details on request) must be used
Background Fluorescence	Minimized due to REDFLASH technology
Optical Isolation	The sensor is equipped with an optical isolation to minimize interference from strong external illumination and light-sensitive / fluorescent samples.

Sensor Dimensions Length without cable (ca.) Shaft diameter (ca.) Sensor tip diameter (ca.) Cable length (ca.)	**PHROBSC-PKx** 100 mm 3 -4 mm (tapered) 4 mm 2 m
Application time	For self-adhesive sensor spots (**-ADH**) limited to max. 1 month
Material of Septum (Sensor Vials)	Butyl/PTFE
Application Areas	Laboratory, industry, research. **NOT** for medical or any safety-critical application. **NOT** for application in humans. **NOT** for application in food intended for human consumption.

[1] time for 90% of the total sensor signal change in stirred media
[2] PK8T versions are specified for measurements between PSU 20-40
[3] sensors can be used once without manual calibration (reduced accuracy), only in combination with pre-calibration ready **FireSting-PRO** devices (labeled with “precal pH”)

Important: Please note that the -AF versions are sensor caps with an anti-(bio)fouling layer containing **zineb**. It is strongly recommended to wear gloves during handling, especially in case of a known contact allergy. If your application involves a closed chamber with living organisms, be aware that exposure to zineb may cause adverse effects such as toxicity, allergic reactions, or respiratory irritation, potentially harming the organisms. **Handle with care**.

1.2 Specifications

PK5 - Version

Specifications	
Item No.	**PHSP5-PK5, PHSP5-PK5-ADH, PHROBSC-PK5**
Measuring Range Optimum Maximum	 4.0 – 6.0 3.5 – 6.5
Accuracy after 2-point calibration pH 4-4.5 pH 4.5-6	 ±0.1 ±0.05
Accuracy pre-calibration pH 4-4.5 pH 4.5-6	 ±0.2 ±0.1

Resolution at pH 5.0	0.003
Drift at pH 5.0	< 0.005 / day at 25°C

PK6 - Version

Specifications	
Item No.	**PHSP5-PK6, PHSP5-PK6-ADH, PHROBSC-PK6**
Measuring Range Optimum Maximum	 5.0 – 7.0 4.5 – 7.5
Accuracy after 2-point calibration pH 5-5.5 pH 5.5-7	 ±0.1 ±0.05
Accuracy pre-calibration pH 5-5.5 pH 5.5-7	 ±0.2 ±0.1
Resolution at pH 6.0	0.003
Drift at pH 6.0	< 0.005 / day at 25°C

PK7 - Version

Specifications	
Item No.	**PHSP5-PK7, PHSP5-PK7-ADH, PHSP5-PK7-ADH-STER, PHROBSC-PK7(-SUB), PHTOVIAL20-PK7, PHCAP-PK7(-AF)-SUB**
Measuring Range Optimum Maximum	 6.0 – 8.0 5.5 – 8.5
Accuracy after 2-point calibration pH 6-6.5 pH 6.5-8	 ±0.1 ±0.05
Accuracy pre-calibration pH 6-6.5 pH 6.5-8	 ±0.2 ±0.1
Resolution at pH 7.0	0.003
Drift at pH 7.0	< 0.005 / day at 25°C

PK8 - Version

Specifications	
Item No.	**PHSP5-PK8, PHSP5-PK8-ADH, PHROBSC-PK8(-SUB), PHTOVIAL20-PK8, PHCAP-PK8(-AF)-SUB**
Measuring Range Optimum Maximum	 7.0 – 9.0 6.5 – 9.5
Accuracy after 2-point calibration pH 7-7.5 pH 7.5-9	 ±0.1 ±0.05
Accuracy pre-calibration pH 7-7.5 pH 7.5-9	 ±0.2 ±0.1
Resolution at pH 8.0	0.003
Drift at pH 8.0	< 0.005 / day at 25°C

PK8T - Version

Specifications	
Item No.	**PHSP5-PK8T, PHSP5-PK8T-ADH, PHROBSC-PK8T(-SUB), PHCAP-PK8T(-AF)-SUB**
pH Scale	"pH total scale" for marine /oceanographic applications
Measuring Range Optimum Maximum	 7.0 – 9.0 6.5 – 9.5
Accuracy after 2-point calibration pH 7-7.5 pH 7.5-9	 ±0.1 ±0.05
Accuracy pre-calibration pH 7-7.5 pH 7.5-9	 ±0.2 ±0.1
Resolution at pH_T 8.0	0.003
Drift at pH_T 8.0	< 0.005 / day at 25°C
Influence of Salinity	Negligible between PSU 30 and 40

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2 APPLICABILITY AND CROSS-SENSITIVITY

	Applicability	Cross-Sensitivity	NO Cross-Sensitivity
Water/Aqueous solutions	X		
Hydrogen peroxide (H_2O_2)		X	
Chlorinated Water		X	
Diluted Ethanol (<5%)	short-term		
Other organic solvents		X	
Charged surfactants (e.g. sodium dodecyl sulfate)		X	
Calibration buffers for pH electrodes		X	
Certified Reference Materials (CRMs) *		X	
Uncharged antifoam agents (e.g. polyethylene glycol, Tween80)			X
Phenol red			X
Ammonium > 25 mM		X	
pH 2-11			X

* except TRIS buffer solution in synthetic seawater (Dr. A. Dickson))

3 CLEANING & STORAGE

Cleaning	Deionized water
Sterilization	• ethylene oxide (EtO, EO) sterilization (details available on request) • 2% glutaraldehyde solution • autoclave sterilization (with restrictions): pH sensors, except for PHCAPs, can be autoclaved once in the gas phase. Caution: Autoclaving in aqueous solution will damage the sensor irreversibly (details available on request or in the pH sensor manual). Note: • pre-sterilized products are available • re-sterilization of pre-sterilized products is not possible • beta or gamma sterilization is not possible
Storage	Original packaging: 12 months at room temperature

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