



SPECIFICATIONS FOR PH INSTRUMENTS ON FIXED PLATFORMS

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Specifications for pH Instruments on Fixed Platforms

Document Control Sheet

Version	Date	Description	Originator
0-01	05/10/2010	Initial Draft	Thien V. Dinh
0-02	05/24/2010	Extracted performance specs from earlier versions	Rob DelCoco
0-03	09/15/2010	Reformatted in accordance with template version 1-01	Art Salwin (Noblis)
0-04	09/17/2010	Minor edits per OL input	Art Salwin (Noblis)
0-05	09/20/2010	Editorial changes.	Art Salwin (Noblis)
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0-07	11/08/2010	Added "not specified" Added appendix table	Arthur Salwin (Noblis)
0-08	11/12/2010	CG and Systems Engineer comments addressed. Posted for 5-day review.	Arthur Salwin (Noblis)
0-09	12/27/2010	Addressed 5-day review comments: Relax accuracy, precision, and drift specifications; changed "type" to "series"; added a series for cabled coastal; changed depths; added leading zero's;	Arthur Salwin (Noblis)
0-10	01/19/2011	Referenced new requirements. Removed true value from accuracy specs.	Arthur Salwin (Noblis)
0-11	01/24/2011	Editorial correction of a referenced document number; added required sampling capability column to appendix table	Arthur Salwin (Noblis) (corrections per Rob DelCoco)
1-00	01/24/2011	Initial Release	Ed Chapman
1-01	05/27/2011	Administrative changes to appendix table and removed Section 3.	Arthur Salwin (Noblis)
1-02	06/13/2011	Removed survivable depth; S.E. approval	Arthur Salwin (Noblis)

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Signature Page

This document has been reviewed and approved for release to Configuration Management.

OOI Senior Systems Engineer:



A handwritten signature in black ink, consisting of several loops and a long horizontal stroke, is written over a horizontal line.

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1 General

1.1 Ocean Observatories Initiative (OOI) Overview

See “Common Specifications for Instruments on Fixed Platforms”

1.2 Document Scope and Purpose

This document contains specifications for instruments that measure pH in seawater. pH instruments will be deployed on fixed platforms.

The instrument shall meet the requirements in this document and those specified in the “Common Specifications for Instruments on Fixed Platforms”, document control number 1336-00000. Parameters specified in neither the “Common Specifications for Instruments on Fixed Platforms” nor in this document are not applicable. This instrument specification shall have precedence over the Common Specification for conflicting items.

1.3 Documents

1.3.1 Informational

The documents listed in this section are for informational purposes only and may not have been referenced in this specification.

- Consortium for Ocean Leadership, Inc. 2010, “Final Network Design”, Washington, D.C. [Online] Available: <http://www.oceanleadership.org/programs-and-partnerships/ocean-observing/ooi/network-design/>

1.3.2 Applicable

These documents contain requirements and specifications applicable to the instrument specified. The referenced section, requirement, or specification shall be met by the instrument specified herein.

“Common Specifications for Instruments on Fixed Platforms”, document control number 1336-00000

1.4 Definitions

1.4.1 Glossary and Acronyms

See “Common Specifications for Instruments on Fixed Platforms”

1.4.2 Conventions

All values contained in this document are Threshold Values unless specifically stated otherwise.

The bidder shall ignore the references in angle brackets < > at the end of each specification. They are for internal OOI use only.

Specifications for pH Instruments on Fixed Platforms

2 Specifications

2.1 Measurement

Values provided are threshold unless otherwise stated.

2.1.1 pH

a) Measurement with unit(s)

pH (dimensionless log scale)

b) Minimum Value

PH-001 The instrument shall measure pH in water over a range with a minimum value of 7.3 units <L2-SR-RQ-3493, L4-CG-IP-RQ-196, L4-RSN-IP-RQ-487>

c) Maximum Value

PH-002 The instrument shall measure pH in water over a range with a maximum value of 8.5 units. <L2-SR-RQ-3493, L4-CG-IP-RQ-196, L4-RSN-IP-RQ-487>

d) Accuracy

PH-003 The instrument shall measure pH in water with an accuracy of ± 0.01 units. <L2-SR-RQ-3490, L4-CG-IP-RQ-190, L4-RSN-IP-RQ-484>

PH-007 The instrument should measure pH in water with an accuracy of ± 0.005 units. This is an objective. <L2-SR-RQ-3785, L4-CG-IP-RQ-529, L4-RSN-IP-RQ-607>

e) Precision

PH-004 The instrument shall measure pH in water with a precision of 0.005 units. <L2-SR-RQ-3782, L4-CG-IP-RQ-528, L4-RSN-IP-RQ-596>

PH-008 The instrument should measure pH in water with a precision of 0.001 units. This is an objective. <L2-SR-RQ-3786, L4-CG-IP-RQ-530, L4-RSN-IP-RQ-608>

f) Resolution

Not specified.

g) Drift

PH-005 The instrument shall measure pH in water with an annual drift of no more than 0.01 units. <L2-SR-RQ-3492, L4-CG-IP-RQ-349, L4-RSN-IP-RQ-486>

h) Response Times

Not specified.

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- i) Sampling Frequency
See Appendix A-1 for sampling frequencies.
- j) Dependencies
Not specified.

2.2 Operational

2.2.1 Operational Depth Range

See Appendix A-1 for operational depths.

2.2.2 Environmental

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.3 Service Requirements

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.4 Calibration Requirements

See the “Common Specifications for Instruments on Fixed Platforms”

2.2.5 Maintenance

See the “Common Specifications for Instruments on Fixed Platforms”

2.3 Mechanical/Physical

See the “Common Specifications for Instruments on Fixed Platforms”

2.4 Electrical

See the “Common Specifications for Instruments on Fixed Platforms”

2.5 Data Storage and Processing

See the “Common Specifications for Instruments on Fixed Platforms”

2.6 Software/Firmware

See the “Common Specifications for Instruments on Fixed Platforms”

2.7 Platform Interfaces

See the “Common Specifications for Instruments on Fixed Platforms”

2.8 Compliance

See the “Common Specifications for Instruments on Fixed Platforms”

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2.9 Safety

See the “Common Specifications for Instruments on Fixed Platforms”

2.10 Shipping and Storage

See the “Common Specifications for Instruments on Fixed Platforms”

2.11 Identification

See the “Common Specifications for Instruments on Fixed Platforms”

2.12 Quality

See the “Common Specifications for Instruments on Fixed Platforms”

3 Appendices

A-1. Specification Values by the Platform on Which the PHSEN Instruments are Deployed

The following table describes the performance and operational constraints, limits, etc. that are different between the different OOI platforms.

Specifications for pH Instruments on Fixed Platforms

PHSEN Series	Cabled	Location	Operational depth range (m)	Required Sampling Frequency Capability	Typical Sampling Frequency	Deployment Interval (months)	Inductive Modem Required	Internal Batteries Required	Internal data Storage Required (# of samples)
A	C	O	0-300	6/hr	6/hr	13	N	N	N
B	C	O	0-300	1/hr	1/hr	13	N	N	N
C	C	C	0-600	1/hr	1/hr	13	N	N	N
D	U	C	0-600	1/hr	1/hr	7	N	(see note 1)	Y(5,200)
E	U	O	0-600	1/hr	1/hr	13	Y	Y	Y(10,000)

Key:

Cabled:

C denotes platforms attached to the electro-optic cable in the Pacific Northwest (cabled)
 U denotes platforms that have no cable connection to shore for power or data (uncabled)

Location:

O is open ocean
 C is coastal

Series A will be deployed on a Shallow Water (winched) profiler.

Note 1: Internal batteries are optional on some of the PHSEN series D platforms. These batteries shall be capable of providing power for the specified Deployment Interval while sampling at the indicated Typical Sampling Frequency.