

General Specifications

Model SA11
Smart Adapter



General

The model SENCOM 4.0 Smart Adapter offers full measuring parameter functionality for analogue Yokogawa sensors equipped with Variopin connector and ID-chip. The re-usable Smart Adapter can be connected directly on top of the sensor or, in case of very high process temperatures, through an extension cable.

Two kinds of measurements are offered, pH/ORP and Contact Conductivity. The pH/ORP measurement is offered in two different modules, SA11-P1 for conventional type pH sensors and SA11-P2 for differential type pH sensors. The Contact Conductivity measurement has one module, the SA11-C1.

Variety of calculated data is selectable. Data can be accessed by a HOST system using reliable digital communication standard MODBUS protocol.

The SENCOM 4.0 Smart Adapter automatically recognizes the installed sensor and prepares the right configuration, thereby creating a plug and play solution which improves the operational excellence in customer application.

The SENCOM 4.0 Smart Adapter offers the best accuracy in measurement with temperature compensation functionality and calibration functionality. Online sensor diagnostics and sensor wellness (e.g glass break detection for pH and polarization detection for Contact Conductivity) provides added reliability, and the integrated logging of events is a useful information source facilitating optimized maintenance.

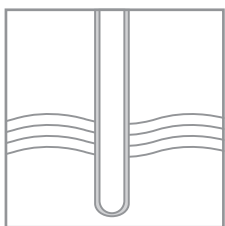
The SENCOM 4.0 Smart Adapter is designed for the wide range of industrial environments and is tested against the latest standards.

Features

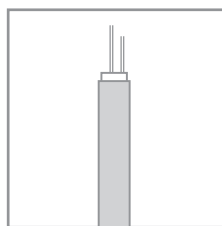
- Re-usable and detachable
- Provides 2 kinds of measuring parameter: pH/ORP or Contact Conductivity
- Connection to analogue sensors (provided with ID-chip) with Variopin connector system and Pt1000 temperature element
- Auto recognition of sensor with plug and play capability
- Offers (calculated) data from sensor measurement with error configuration
- Calibration functionality by trigger from HOST
- Online sensor diagnostics, sensor wellness and predictive maintenance
- Integrated logbook function
- Reliable digital output which can be connected to HOST system by WU11 cable up to 200 meter
- Direct mounting on top of the sensor or through a WE10 extension cable (2.95 meter / 9.7 ft.)
- Galvanic isolated electronics to prevent interference from other measurements
- Wide ambient temperature application -30 up to +100°C / -22 up to +212°F for power supply +2.7 to +4.5VDC, -30 up to +125°C / -22 up to +257°F for power supply +4.5 to +5.5VDC



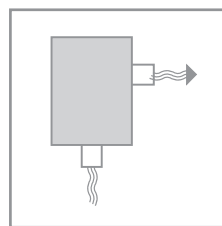
System Configuration



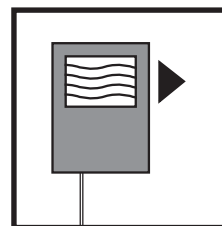
Sensors



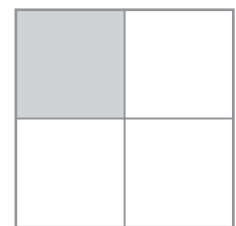
Cables



Fittings



Transmitters



Accessories

General Specifications

1. pH/ORP/rH

1-1 Basic

Measurement parameters

- Temperature compensated pH/Oxidation Reduction Potential (pH/ORP)
- Temperature
- Glass- and reference impedance

Note: The SENCOM 4.0 Smart Adapter can be used for analogue Yokogawa pH sensors with Variopin connector equipped with an integrated Pt1000 temperature element and integrated ID-chip.

1-2 Measurement

Input Specification

Dual high impedance input ($\geq 5 \times 10^{12} \Omega$) with liquid earth connection. SA11-P1 type however can operate with pH sensors with or without liquid earth.

Input signal range

pH : -2 to 16 pH
 ORP : -1500 to +1500 mV
 Temperature : -40 to +260°C (-40 to +500°F)
 Impedance : 0.1kΩ to 10MΩ

Note: SENCOM 4.0 Smart Adapter with suffix code -J (Japanese version) is limited to pH range 0 to 14pH.

Performance

(The specifications are expressed with simulated inputs).

pH:	Linearity	: ±0.01 pH
	Repeatability	: ±0.002 pH
	Accuracy	: ±0.01 pH
	Step response (t_{90})	: ≤ 1 sec.
	Ambient temp. drift	: ≤ 0.0002 pH/°C
ORP:	Linearity	: ±1 mV
	Repeatability	: ±0.1 mV
	Accuracy	: ±1 mV
	Step response (t_{90})	: ≤ 1 sec.
	Ambient temp. drift	: ≤ 0.01 mV/°C
Temperature:	Linearity	: ±0.3 °C
	Repeatability	: ±0.1 °C
	Accuracy	: ±0.3 °C
	Step response (t_{90})	: ≤ 1 sec.
	Ambient temp. drift	: ≤ 0.005 °C/°C
Impedance:	Accuracy	: ≤ 10% ± 0.3kΩ

(Calculated) output functions

These are calculated functions using one or more input signals and/or settings. Availability of these functions depends on type of sensor.

pH:	ZERO, SLOPE, ITP (by 1, 2 or 3 points calibration) Temperature compensated pH (none, process, matrix, NEN 6411)
ORP:	ZERO, SLOPE (by 1 or 2 points calibration) Standard REF-, and/or pH compensated ORP
rH	
Temperature:	Automatic (with offset compensation), manual- or external input

Note: The SENCOM 4.0 Smart Adapter can be set by user in pH or mV for ZERO, mV/pH or percentage (%) for SLOPE and Celsius (°C) or Fahrenheit (°F) for temperature.

2. Contact Conductivity (SC)

2-1 Basic

Measurement parameters

- Conductivity/Resistivity
- Temperature
- Polarization

Note: The SENCOM 4.0 Smart Adapter can be used for analogue Yokogawa conductivity sensors with Variopin connector equipped with an integrated Pt1000 temperature element and integrated ID-chip.

2-2 Measurement

Input Specification

Two/Four electrodes measurement with square wave excitation for sensors with cell constants (C.C.) from 0.005 to 50.0 cm-1.

Input signal range

Conductivity : 0 μS/cm to 250 mS x C.C.
 (overrange 5000 mS/cm).
 Resistivity : 0.004 kΩ x C.C. to 10 MΩ x C.C.
 (overrange 100 MΩ x cm)
 Temperature : -40 to +260°C (-40 to +500°F)

Performance (The specifications are expressed with simulated inputs, in % of reading).

Conductivity:	Linearity	: ±0.5%
	Repeatability	: ±0.1%
	(for 0...1μS/cm)	: ±0.5%± 0.2nS)
	Accuracy	: ±0.5% ± 0.2nS
	Step response (t_{90})	: ≤ 1 sec. (2 decades)
Resistivity:	Ambient temp. drift	: ≤ 100 ppm/°C
	Linearity	: ±0.5%
	Repeatability	: ±0.1%
	(for 1M..10MΩ/ C.C.)	: ±0.5%)
	Accuracy	: ±0.5%
Temperature:	Step response (t_{90})	: ≤ 1 sec. (2 decades) ≤ 2 sec. (5 decades)
	Ambient temp. drift	: ≤ 100 ppm/°C
	Linearity	: ±0.3 °C
	Repeatability	: ±0.1 °C
	Accuracy	: ±0.3 °C
Step response (t_{90})		: ≤ 1 sec.
	Ambient temp. drift	: ≤ 0.005 °C/°C

(Calculated) output functions

These are calculated functions using one or more input signals and/or settings. Availability of these functions depends on type of sensor.

Conductivity:	Temperature compensated SC (none, linear, NaCl, matrix)
Resistivity:	Temperature compensated RES (none, linear, NaCl, matrix)
Temperature:	Automatic (with offset compensation), manual- or external input
USP <645>:	United States Pharmacopoeia, water conductivity
Concentration:	e.g. Total Dissolved Solids

Note: The SENCOM 4.0 Smart Adapter can be set by user in Celsius (°C) or Fahrenheit (°F) for temperature, and in cm⁻¹ or m⁻¹ for Cell Constant.

3. All parameters

3-1 Architecture of SENCOM 4.0 Smart Adapter with VP connector

A re-usable and detachable housing assembly which consists of galvanic isolated parameter specific electronics. This is provided with an 8 pins Variopin female connector for connection to the analogue sensor, possibly with an extension cable, and a 5 pins male connector for connection to the HOST.

3-2 Electrical

• Output signal

General	: Bi-directional digital communication (RS485, half-duplex) with full MODBUS (RTU) support in slave mode.
Data rate	: 9600 b/s (8, E, 1) 19200 b/s (8, N, 2)
Refresh rate	: 500 ms. (main parameters)
Isolation	: 500VAC against input

• Power supply

Operating	: 2.7 to 4.5 VDC /15mW max.; 4.5 to 5.5 VDC /65mW max.
Isolation	: 500VAC against input

3-3 Mechanical and others

• Housing (excluding connectors)

Material	: Stainless Steel (SS316L)
Shape/size	: Cylindrical, Ø21mmx122 mm

• Connectors

- 8-pins female Variopin connector for connection to the analogue sensor (pH/ORP).	
Material	: Nickel-plated brass
Insulation	: PEEK, UL94-V0
Contacts	: Gold-plated
- 5-pins M9 male connector for connection to the HOST system (RS485 and power supply).	
Material	: Nickel-plated brass
Insulation	: Polybutylene terephthalate (PBT), UL94-V0
Contacts	: Gold-plated
• Sealings	: EPDM, Viton, FKM
• IP class	: IP67, NEMA250 type 4X

• Mounting

Direct on top of the analogue sensor or via optional VP extension cable (max. length 2.95 meter / 9.7 ft.);
Wall- and Pipe mounting hardware is optional.

• Labelling

Adhesive metallized polyester thermal transfer printable sticker.

• Weight

Approximately 120 gr.

• Ambient operating temperature

-30 up to +100°C / -22 up to +212°F for power supply +2.7 to +4.5VDC, -30 up to +125°C / -22 up to +257°F for power supply +4.5 to +5.5VDC

Notes: The SENCOM 4.0 Smart Adapter can withstand temporarily ambient temperature to -40°C (-40°F) or +150°C (+302°F) without permanent damage;

When connected using the WE10 extension cable, the maximum operating temperature of the SENCOM 4.0 Smart Adapter is limited to +55°C (+131°F) for pH/ORP application.

• Storage temperature

-30 up to +50°C (-22 up to +122°F)

• Regulatory compliance

CE	: Decision 768/2008/EC
Safety	: EN/IEC61010-1:2010 (For electrical equipment for measurement, control and laboratory use). Overvoltage Category I, Pollution Degree 2, Altitude ≤ 2000m
EMC	: EN 61326-1:2013 (Class A, Table 2) EN 61326-2-3 AS/NZS CISPR11 Korea Electromagnetic Conformity Standard (Class A Regulatory Compliance Mark Level 2)
RoHS2	: Directive 2011/65/EU (Category 9: Industrial monitoring and control equipment)
REACH	: Regulation (EC) No.1907/2006

• Shipping details (LxWxH)

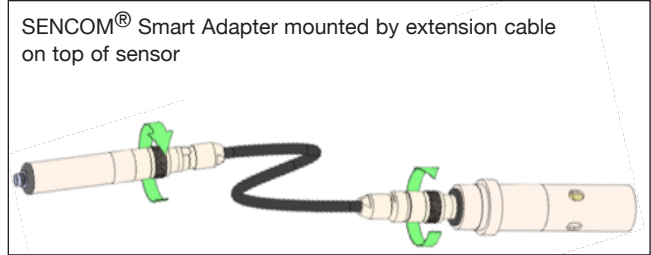
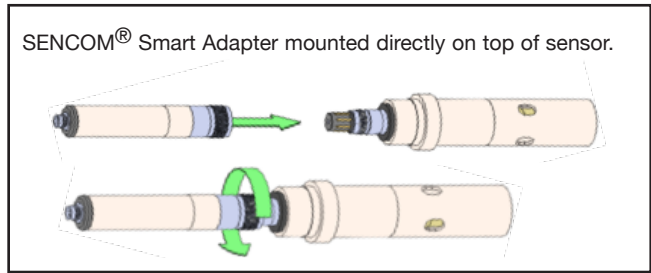
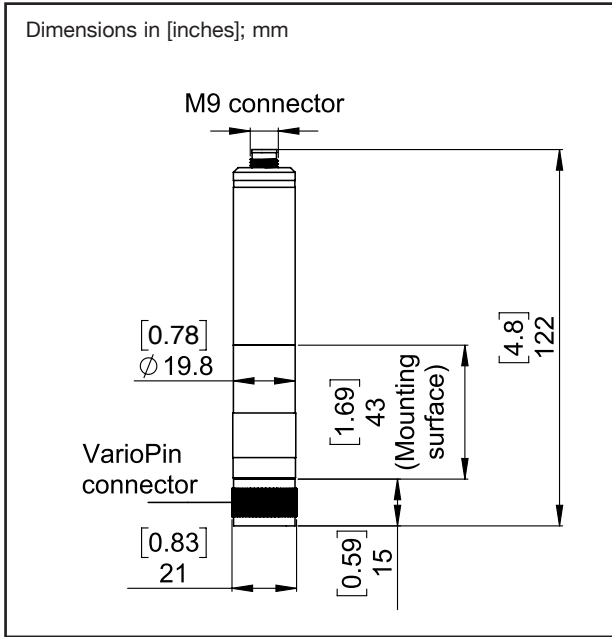
Approximately 300x100x75 mm (11.8x3.9x2.9 inch)

4. Model & Suffix Codes

Model	Suffix code	Option code	Description
SA11			SENCOM Smart Adapter
	-C1		Contact Conductivity (SC)
	-P1		pH/ORP, conventional
	-P2		pH/ORP, differential
Type	-AA		General purpose
Region	-N		Not specified
Connection type	-VS		Variopin
--	-NN		Always -NN
Option		/UM	Pipe and wall mounting hardware

Notes: Code -P1 is for conventional pH/ORP, to be used with pH sensors with standard (non)flowing reference system;
Code -P2 is for differential pH/ORP, to be used with salt sensitive reference system;
Option /UM can be ordered as part of modelcode or as spare part K1548PQ.

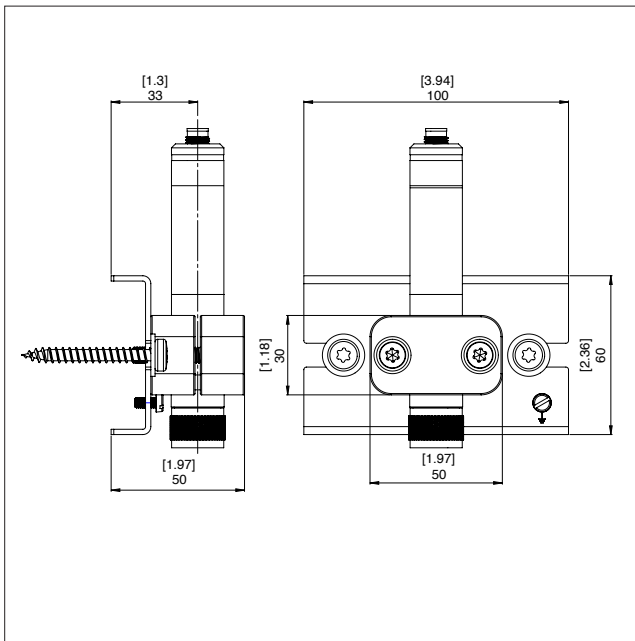
5. Dimensions and Mounting



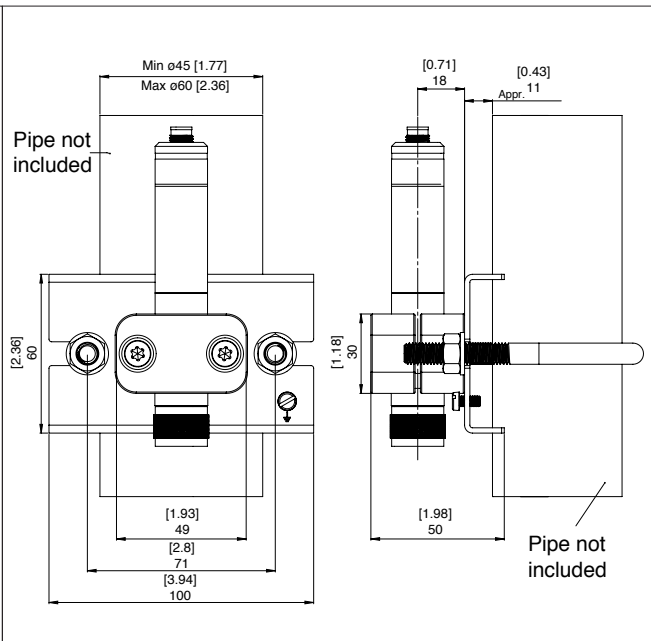
Note:
SA11-P1 to be used in combination with WE10-H-D-003-V1 cable;
SA11-P2 and SA11-C1 to be used in combination with WE10-H-D-003-V2 cable

- SENCOM 4.0 Smart Adapter mounted with optional wall- and pipe mounting hardware (/UM)

Wall mounting



Pipe mounting



YOKOGAWA HEADQUARTERS
9-32, Nakacho 2-chome,
Musashinoshi
Tokyo 180
Japan
Tel. (81)-422-52-5535
Fax (81)-422-55-1202
www.yokogawa.com

YOKOGAWA EUROPE B.V.
Euroweg 2
3825 HD AMERSFOORT
The Netherlands
Tel. +31-88-4641 000
Fax +31-88-4641 111
E-mail: info@nl.yokogawa.com
www.yokogawa.com/eu

YOKOGAWA CORPORATION OF AMERICA
2 Dart Road
Newnan GA 30265
United States
Tel. (1)-770-253-7000
Fax (1)-770-251-2088
www.yokogawa.com/us

YOKOGAWA ELECTRIC ASIA Pte. Ltd.
5 Bedok South Road
Singapore 469270
Singapore
Tel. (65)-241-9933
Fax (65)-241-2606
www.yokogawa.com/sg

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