

# 2-Wire Conductivity/Resistivity Analyzers SC202



## SC202

### 2-Wire Conductivity/Resistivity Analyzers

*The SC202, two-wire conductivity/resistivity analyzers with a microprocessor, brings you the benefit of Yokogawa's extensive solution conductivity measurement experience and state-of-the-art sensor technology.*

Bulletin 12D08B02-01E

[www.yokogawa.com](http://www.yokogawa.com)

# The SC202 Meets Today's Demands for Advanced Conductivity / Resistivity Measurement

Flexibility, reliability and low maintenance are among the benefits provided by the EXA SC202 conductivity analyzer.

Designed to meet the exacting requirements of measuring conductivity and resistivity in the modern industrial environment, it contains many features to ensure the best precision whatever the application.

The SC202 meets the demanding ultrapure water requirements of the growing semiconductor and pharmaceutical markets in addition to traditional water quality measurements for standard power plant and chemical applications.

Furthermore, the SC202 is useful as a concentration meter when liquid to be measured has a clear relationship between conductivity and concentration.



The SC202,

a two-wire conductivity analyzer with an

incorporated microprocessor,

can bring you the benefit of flexibility

reliability and low maintenance based on Yokogawa's extensive liquid

conductivity measurement experience.

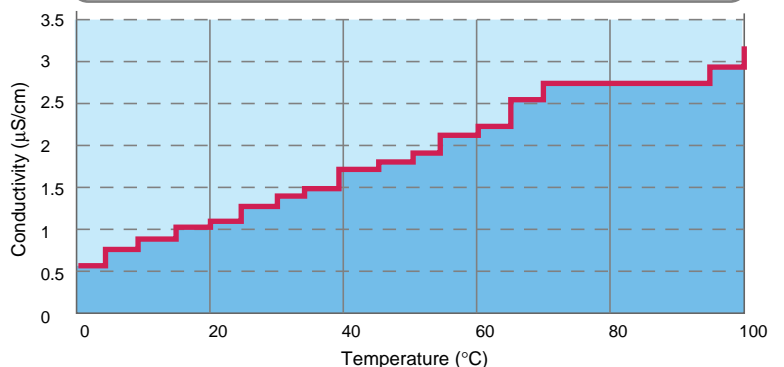
## Features

- Universal conductivity/resistivity, software switchable
- Pure water monitoring according to USP <645>
- Remote range switching
- Programmable reference temperature and temperature coefficient for temperature compensation
- Password protection for all operation levels
- Configurable output range, including linear or bi-linear

## USP Monitoring

The SC202 monitors water quality according to USP <645> (United States Pharmacopoeia) that determines a level of uncompensated conductivity at each temperature. The conductivity of water must be below this level to be acceptable. The USP limits are preprogrammed into the SC202 and are used in the setpoint calculations for the alarms and trip.

USP <645> Conductivity Limits as a Function of Temperature

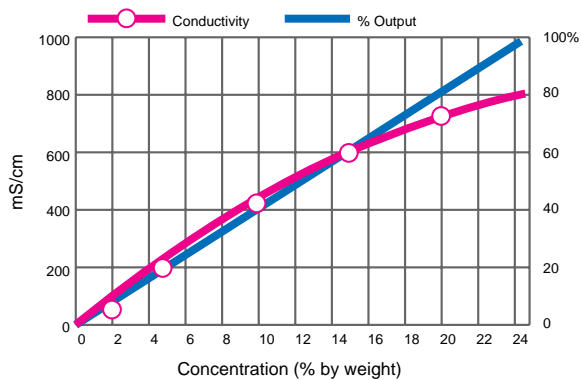


## The convenience of linearized output

Conductivity characteristics curves differ substantially for different solutions. In cases where the solution conductivity does not vary in direct proportion to concentration, the line-segment linearized output function really works. The SC202 intelligent transmitter two-wire conductivity system can implement line-segment output linearization functions with 21 steps. This allows reliable measurement of conductivity at both high and low concentrations, fitting in well with the properties of the measured liquid. This function is particularly useful in chemical, food processing, and pharmaceutical plants.

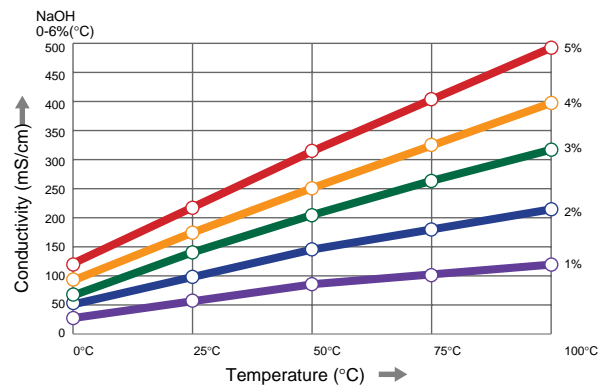
### Linearization

As a concentration meter, the programmable output function provides outputs linear to concentration.



### Matrix Temperature Compensation

Incorporated to ensure accurate temperature compensation. Five preprogrammed matrices and a 25-point user programmable matrix are available.



## Compact Detectors Best Suited for Low Conductivity Measurements

Intended for the low conductivity applications found in the semiconductor, power, water and pharmaceutical industries, the SC4AJ Two-Electrode Type Conductivity Sensor is in a convenient compact style. The outside diameter of the electrode is as small as approximately 19 mm. There are several mounting possibilities, including direct insertion and clamp mounting, two types of electrode material, stainless steel or titanium, and two types of cell constant, 0.02 cm<sup>-1</sup> or 0.1 cm<sup>-1</sup>. Integrating a cable, the SC4AJ sensor is robust and easy to use. The sensor is ideally suited for the process where pure water is manufactured or used.



Adapter Mounting  
(-AD-09)



Adapter Mounting  
(-AD-15)



Welding Socket Mounting



Clamp Mounting

### Features

- Compact style of 19 mm diameter
- Suited for low conductivity applications
- Fast temperature response for accurate conductivity measurements
- Stainless or titanium selectable
- Wide range of mountings

### Resistivity Measurements

When used with the SC202 converter, the SC4AJ sensor can be used for high resistivity applications such as pure water. The SC202 displays the resistivity in kΩ-cm or MΩ-cm.

Refer to GS 12D08G02-E for SC4AJ information.

## Specifications

### • Input Specification

Two- or four-electrode measurement with cell constant from 0.008 to 50.0 cm<sup>-1</sup>

### • Measuring Range

- Conductivity
  - Minimum : 0μS/cm
  - Maximum : 200 mS x (Cell constant) (overrange 1999 mS/cm)
- Resistivity
  - Minimum : 0.005 kΩ / (Cell constant)
  - Maximum : 999MΩ·cm
- Temperature
  - Pt1000 : -20 – 250°C (0-500°F)
  - Pt100/Ni100 : -20 – 200°C (0-400°F)
  - 8.55KΩNTC : -10 – 120°C (10-250°F)
  - PB36NTC : -20 – 120°C (0-250°F)

### • Output Span

- Conductivity
  - Min. span 0.010μS/cm
  - Max. span 1999 mS/cm (Max. 90% zero suppression)
- Resistivity
  - Min. span 0.001kΩ·cm
  - Max. span 999MΩ·cm (Max. 90% zero suppression)

### • Display

Liquid crystal display, Main display: 3 1/2 digit 12.5 mm height Message display: 6 alpha-numeric characters, 7 mm height Warning flags and units (mS/cm, kΩ·cm, μS/cm and MΩ·cm)

### • Transmission Signal

4-20 mA DC Isolated output  
Conductivity or resistivity selective

### • Performance (under reference conditions with sensor simulation)

- Conductivity (2 μS x K cm<sup>-1</sup> to 200 mS x K cm<sup>-1</sup>)
    - Linearity, Repeatability : ±0.5%FS
  - Conductivity (1 μS x K cm<sup>-1</sup> to 2 μS x K cm<sup>-1</sup>)
    - Linearity, Repeatability : ±1%FS
  - Resistivity (0.005kΩ / K cm<sup>-1</sup> to 0.5MΩ / K cm<sup>-1</sup>)
    - Linearity, Repeatability : ±0.5%FS
  - Resistivity (0.5MΩ / K cm<sup>-1</sup> to 1MΩ / K cm<sup>-1</sup>)
    - Linearity, Repeatability : ±1%FS
  - Temperature (Pt1000, PB36 NTC, Ni100)
    - Linearity, Repeatability, Accuracy : ±0.3°C (190°C or more with Pt1000; ±1°C)
  - Temperature (Pt100, 8.55kΩ NTC)
    - Linearity, Repeatability, Accuracy : ±0.4°C
  - Temperature compensation
    - NaCl table : ±1°C
    - Matrix : ±3°C
- Step response : 90% (<2decade), less than 7 seconds
- Note : "FS" means maximum setting value of transmitter output. "K" means cell constant. YOKOGAWA provides conductivity sensors which cell constant are 0.1 to 10 cm<sup>-1</sup>. The following tolerance is added to above performance.  
mA output tolerance : ±0.02 mA of "4-20 mA"

### • Power Supply

- SC202G : Up to 40 V DC
- SC202SJ : Up to 31.5 V DC

\* Refer to GS12D08B02-01E

## Model & Code

### 2-Wire Conductivity Transmitter (Non Explosionproof type) [Style : S3]

Model	Suffix Code	Option Code	Description
SC202G	- - - - -	- - - - -	2-Wire Conductivity Transmitter
Type	-A	- - - - -	mA with HART
Language	-J -E	- - - - -	Japanese English
Option	Mounting Hardware	/U	Pipe, Wall mounting bracket (Stainless steel)
	Hood	/PM /H /H2	Panel mounting bracket (Stainless steel) Hood for sun protection (Carbon steel) Hood for sun protection (Stainless steel)
	Tag Plate	/SCT	Stainless steel tag plate
	Conduit Adapter	/AFTG /ANSI /TB /X1	G1/2 NPT 1/2 Screw terminal (*1) Epoxy baked finish (*2)

\*1 It can be specified when the suffix code-A is selected.

\*2 The housing is coated with epoxy resin.

### 2-Wire Conductivity Transmitter (Explosionproof type) [Style : S2]

Model	Suffix Code	Option Code	Description
SC202SJ	- - - - -	- - - - -	Intrinsically safe type conductivity transmitter
Type	-1	- - - - -	TIIS Certification(*1)
Language	-J -E	- - - - -	Japanese English
Option	Mounting Hardware	/U	Pipe, wall mounting bracket (Stainless steel)
	Hood	/PM /H /H2	Panel Mounting bracket (Stainless steel) Hood for sun protection (Carbon steel) Hood for sun protection (Stainless steel)
	Tag Plate	/SCT	Stainless steel tag plate
	Conduit Adapter	/AFTG /ANSI /TB /SPS /X1	G1/2 1/2NPT Screw terminal With screws for salt protection(*2) Epoxy baked finish (*3)

SC202SJ is available only for Japan, South Korea, Taiwan, China, and Russia.

\*1 "TIIS Certification" as a certified explosion approval from the Technology Institution of Industrial Safety.

\*2 The SUS screws with teflon coating are used at the four corners of the cover.

\*3 The housing is coated with epoxy resin.

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