

General Specifications

Model SC100
EXA100 Series
Panel Mount Conductivity Measurement System

EXA SC

GS 12D11A01-01E

GENERAL

The EXA100 Series Panel Mount Conductivity Measurement System is ideally suited for applications using simplified instrumentation such as boiler water, and hydroponics.

Based on the design concept of conductivity meters through our experiences and achievements in the broad PA market for years, the system is highly reliable and has necessary basic functionality while retaining capabilities of existing models. The converter packs simple functions in its compact housing, and also incorporates various self-diagnostics features for which the current EXA Series have a high reputation. With a sophisticated and elegant design, the Yokogawa brand delivers reliability that you can depend upon.

Dedicated conductivity sensors to the EXA100 Series utilize the detection system of our field-proven technology. They are of miniaturized and lightweight design, offering improved ease of use. The SC4A, SC4AJ 2-electrode Conductivity Sensor in our conductivity sensor lineup may be used.



Converter

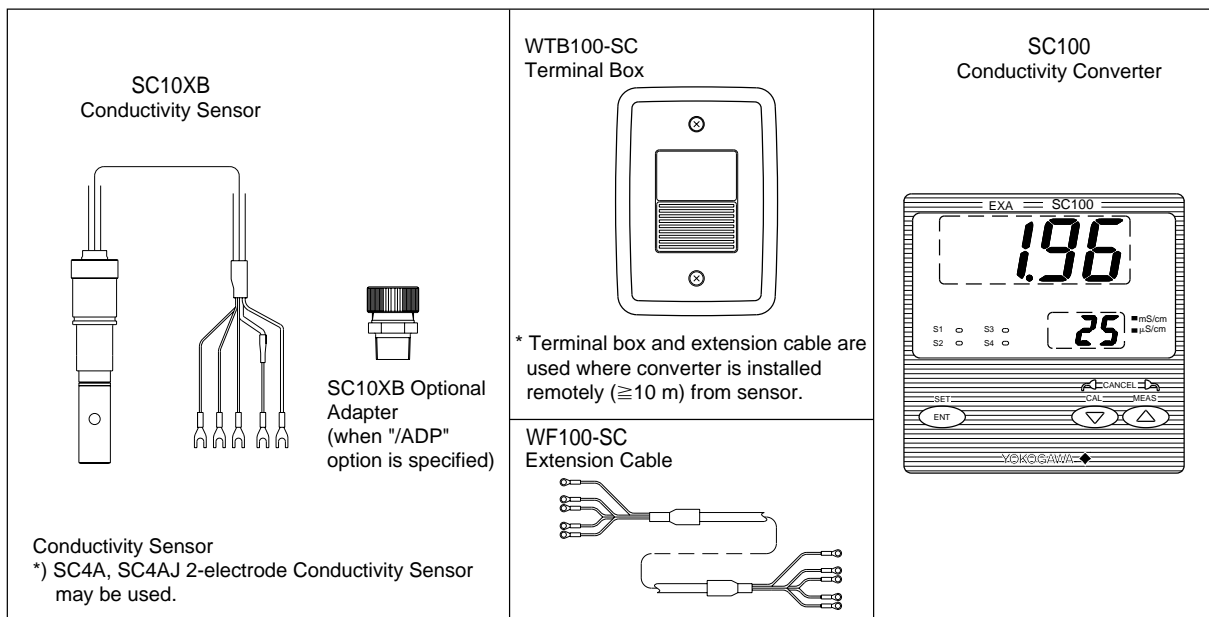


Sensor

FEATURES

- 96 x 96 mm panel mount design for indoor use
- Easy access to routine maintenance mode
- Practical functions packed in a compact housing
- Large 4-degit display
- One analog output and two/four contact outputs as standard
- Self-diagnostics (e.g., calibration failure, measuring range failure, converter failure)

SYSTEM CONFIGURATION



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■ GENERAL SPECIFICATIONS

1. Panel Mount Conductivity Converter

Model: SC100

Measurement: Conductivity of a solution

Measuring range: 0 to 50 mS × K cm⁻¹

Note: "K" means cell constant. Measuring range is defined by the sensor used. For details of applicable sensors, refer to corresponding general specifications (GS).

Temperature input: Pt1000/Pt100

Temperature measuring range: -10 to 110°C

Indication

Display: Digital (LED)

Range: 0.000 μS/cm to 200.0 mS/cm

Indication: Conductivity reading, setting, status, temperature (range: -10 to 110°C)

Transmission signal output

Number of output points: 1 output, conductivity reading only

Output signal: 4 to 20 mA DC, isolated

Load resistance: 600 Ω or less

Transmission signal range: Configurable within measuring range

Lower limit range: 0 μS/cm to 180 mS/cm

Upper limit range: 0.20 μS/cm to 200 mS/cm

The difference between the upper and lower limits of a range should be at least 0.2 μS/cm and the lower limit should not be greater than 90% of the upper limit.

Note: This configurable range is for the converter itself.

Configurable range is defined by the sensor used.

Maintenance output signal: Output hold "enabled/disabled" selectable

Hold output value: Last measured value/preset value (2.0 to 20.8 mA) selectable

Fail output signal: Downscale burnout (2 mA) "enabled/disabled" selectable

Contact output

Contact Type: Relay contact output

Number of contacts: 2 or 4 outputs

Note: Should be specified when ordering.

Contact action: On/Off

Contact functions: Selectable, High, low, high-high, low-low, high-high/low-low limit alarms, FAIL

Alarm setting resolution: 0.000 μS/cm to 200.0 mS/cm

Contact output hysteresis: 0 to 100% (configurable)

Contact output delay time: 0 to 200 seconds (configurable)

Contact rating:

In case of 2 contact outputs

S1: 240 VAC 3A or 30 VDC 3A (resistance load), Form C (NC/NO/COM, 3 terminals)

S2: 240 VAC 3A or 30 VDC 3A (resistance load), Form A (NO/COM, 2 terminals)

In case of 4 contact outputs

When 4 contact outputs specified

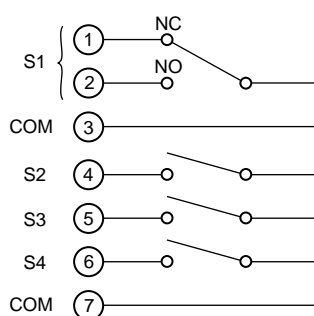
S1: 240 VAC 3A or 30 VDC 3A (resistance load), Form C (NC/NO/COM, 3 terminals)

S2, S3, S4: 240 VAC 3A or 30 VDC 3A (resistance load), Form A, shared common

Maximum load current on common is 3A.

Contact status:

Terminal



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Contact	Function selected						
		H, L, HH, LL, HH/LL limit alarms			FAIL		
		Power off	Power on		Power off	Power on	
		No alarm	Alarm		No alarm	Alarm	
S1	NO-COM	Open	Open	Closed	Open	Closed	Open
	NC-COM	Closed	Closed	Open	Closed	Open	Closed
S2		Open	Open	Closed	Open	Closed	Open
S3 when specified		Open	Open	Closed	Open	Closed	Open
S4 when specified		Open	Open	Closed	Open	Closed	Open

Note: When a contact is activated, the LED on display panel turns on.

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Ambient temperature: -5 to 45°C

Storage temperature: -25 to 70°C

Ambient humidity: 10 to 90% RH, non-condensing

Construction: Front panel: Dust-proof and drip-proof construction IP55

IP65 (when "/65" option is specified)

Materials: ABS resin and polycarbonate

Power supply: Rated voltage 100 to 240 VAC (±10%) 50/60 Hz

Power consumption: Max. 9 VA

Weight: Approx. 600g

Dimensions: 96 (W) x 96 (H) x 122 (D) mm

Mounting: Panel mount

Panel cutout dimensions: 92 (W) x 92 (H) mm

Wiring: M4 screw terminal (Protective ground terminal), M3.5 screw terminal (other terminals)

Grounding: Ground to earth (grounding resistance 100Ω or less)

Functional specifications

Reference temperature conversion: 0.00 to 10.00%/°C or NaCl coefficient compensation

Reference temperature setting range: 0 to 100°C

Cell constant setting range: 0.0001 to 12.00

Temperature value adjustment (cable length correction by temperature 1-point calibration)

Sensor cable length correction

Calibration:

Manual zero calibration (air calibration)

Span calibration (specified setting by specified solution, 1-point calibration)

Note: Temperature indication is available during manual calibration

Self-diagnostics:

FAIL output: Measuring range failure, temperature range failure, temperature sensor failure, converter failure, invalid temperature compensation

Error indication: Calibration value failure, abnormal temperature range during calibration, calibration solution measuring range failure

Converter performance: (under reference conditions with sensor simulation)

Conductivity: $5 \mu\text{S} \times \text{K cm}^{-1}$ to $50 \text{ mS} \times \text{K cm}^{-1}$

Repeatability: $\pm 1\%$ F.S.

Temperature reproducibility: $\pm 1^\circ\text{C}$

Converter output tolerance: $\pm 0.3\%$ of output span

Note: "F.S." means maximum setting value of converter output. "K" means cell constant. YOKOGAWA provides conductivity sensors which cell constant are 0.02, 0.05 and 0.1 cm^{-1} . For details, refer to corresponding general specifications (GS).

Applicable sensors:

SC10XB Conductivity Sensor for SC100

SC4A, SC4AJ 2-electrode Conductivity Sensor

Note: Refer to document GS12D08G02-E when using SC4A, SC4AJ sensor.

2. Conductivity Sensor for SC100

Model: SC10XB

Measurement: Conductivity of a solution

Measurement principle: Electrode method

Type: SC10XB (2-electrode type)

Measuring range: $2.0 \mu\text{S/cm}$ to 2.0 mS/cm

Cell constant: 0.05 cm^{-1}

Installation: Piping adapter connection (option specified)
Drop-in type

Sample temperature range: 0 to 70°C

Sample pressure: 0 to 500 kPa

Temperature detector: Pt1000

Wetted part materials: SUS316, polypropylene, fluorinated rubber (adapter O-ring for piping connection), rigid PVC resin
In case of drop-in type, silicone rubber, PPS resin, chlorinated polyethylene rubber (cable sheath)

Adapter material: Rigid PVC resin

Cable type: 4-conductor complex cable

Cable length: 3, 5, 10 m (up to 50 m with sensor cable included when using terminal box)

Note: When using WTB100 terminal box and extension cable, total length including sensor cable should not exceed 50 m.

Weight approx: 280 g (3m), 400 g (5m), 770 g (10m)

3. Terminal Box for SC100

Model: WTB100

Construction: Outdoor installation, JIS C0920 rain-proof

Case material: Glass fiber filled polycarbonate resin

Case color: Grayish green (Munsell 2.5GY5.0/1.0 equivalent)

Mounting: Bracket mounting (no hardware required), pipe mounting (optional hardware), wall mounting (optional hardware)

Weight:

Body: Approx. 0.5kg

Mounting hardware (optional): Approx. 0.7kg (pipe mounting), 0.3kg (wall mounting)

Operating ambient temperature: -10 to 50°C

Cable inlet: (to be drilled for wiring)

For sensor cable: 13 mm diameter hole, JIS A8-equivalent cable gland included

For dedicated extension cable: 21 mm diameter hole, JIS A15-equivalent cable gland included

Note: WF100 extension cable (but not sensor cable) can be protected by conduit using conduit adapter.

A conduit adapter is supplied when "/AWTB" or "/ANSI" option code is specified.

4. Extension Cable for SC100

Model: WF100

Type: Specialty 4-conductor cable

Finished outside diameter: $\varnothing 6.5 \text{ mm}$

Sheath material: Chlorinated polyethylene rubber

■ Model and Suffix Codes

1. Panel Mount Conductivity Converter, SC100

Model	Suffix code	Option code	Description
SC100	-----	-----	Panel mounted conductivity converter
-----	-A	-----	Always -A
Label language	-E	-----	English
	-J	-----	Japanese
Contact output	-21	-----	2 contact outputs
	-41	-----	4 contact outputs
-----	-NN	-----	Always -NN
Option	Unit	/UNIT	S/m
	Construction	/65	with sealing

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Maintenance Parts

Parts Name	Parts No.	Description
Mounting bracket	T9115NL	Large bracket (mount at up) and small bracket (mount at bottom)

2. Conductivity Sensor for SC100, SC10XB

Model	Suffix code	Option code	Description
SC10XB	-----	-----	Conductivity sensor for SC100
Cable length	-03	-----	3m
	-05	-----	5m
	-10	-----	10m
-----	-AA	-----	Always -AA
Combination adapter	-AAA	-----	w/o adapter
	-ADP	-----	with adapter *1
Cell constant	-005	-----	Cell constant 0.05 cm ⁻¹
-----	-NN	-----	Always -NN
Option	Piping adapter	/ADP	Direct insertion screw connection R3/4

Notes *1: O-ring for piping adapter (/ADP) is included. Must be selected when optional piping adapter is specified.

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3. Terminal Box for EXA100, WTB100

Model	Suffix code	Option code	Description
WTB100	-----	-----	Terminal box for EXA100 Series
Measurement system	-SC	-----	For SC100
-----	-NN	-----	Always -NN
Option	Mounting hardware	/P	For pipe mounting
		/W	For wall mounting
	Conduit adapter	/AWTB	Conduit connection: G1/2 female
		/ANSI	Conduit connection: 1/2 NPT

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5. Cable for Terminal Box for EXA100, WTB100

Model	Suffix code	Option code	Description
WF100	-----	-----	Extension cable for EXA100 Series
Measurement system	-SC	-----	For SC100
Option	Cable length	/C01	5m
		/C02	10m
		/C03	15m
		/C04	20m
		/C05	25m
		/C06	30m
		/C07	35m
		/C08	40m
		/C09	45m

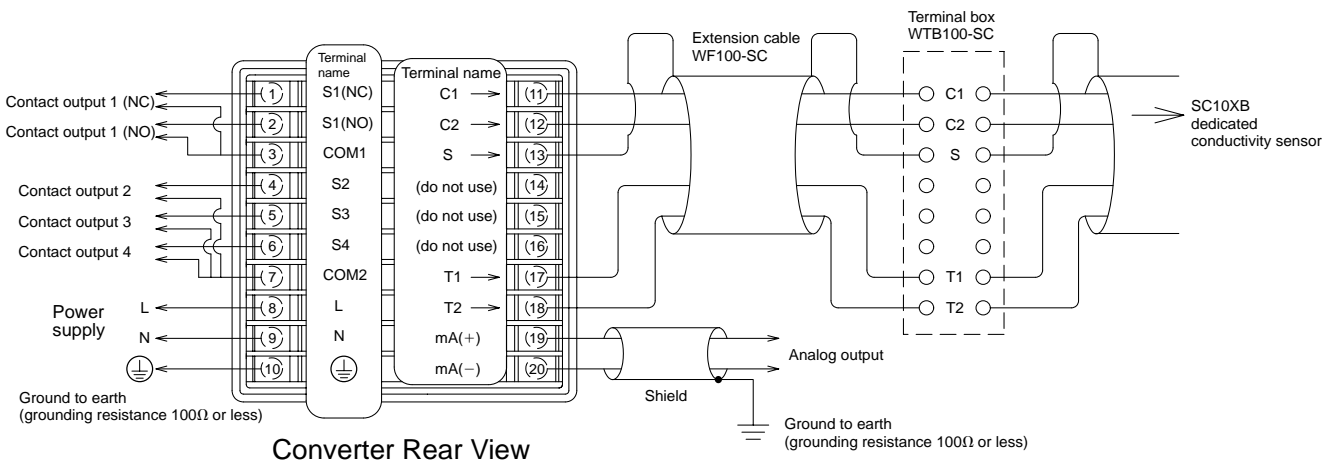
Note *1 : Total length including sensor cable length should not exceed 50 m. Can be used with the SC10XB.

T05E.EPS

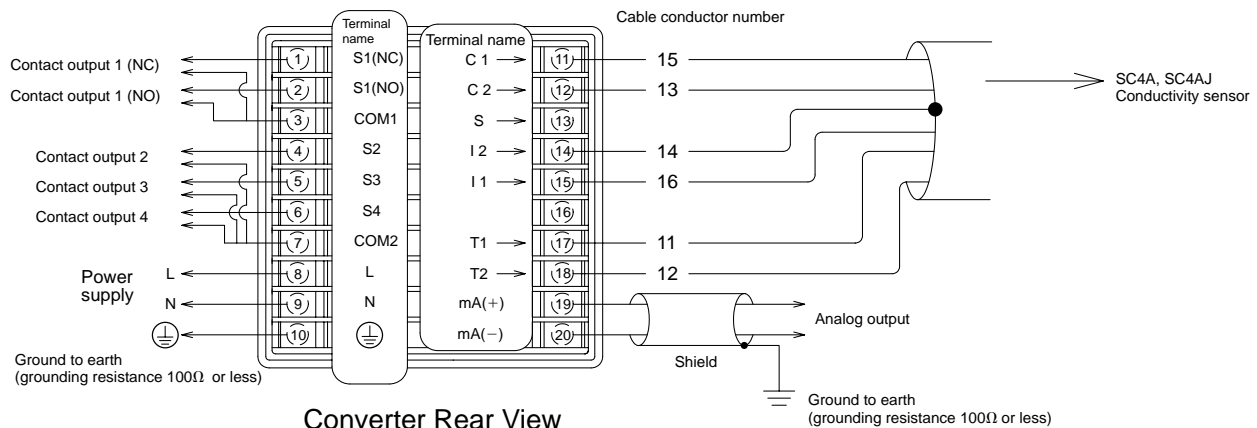
External Wiring Diagram

Wiring Diagram: Converter - Terminal box - Sensor

<SC100 Converter - SC10XB Sensor>



<SC100 Converter - SC4A, SC4AJ Sensor>

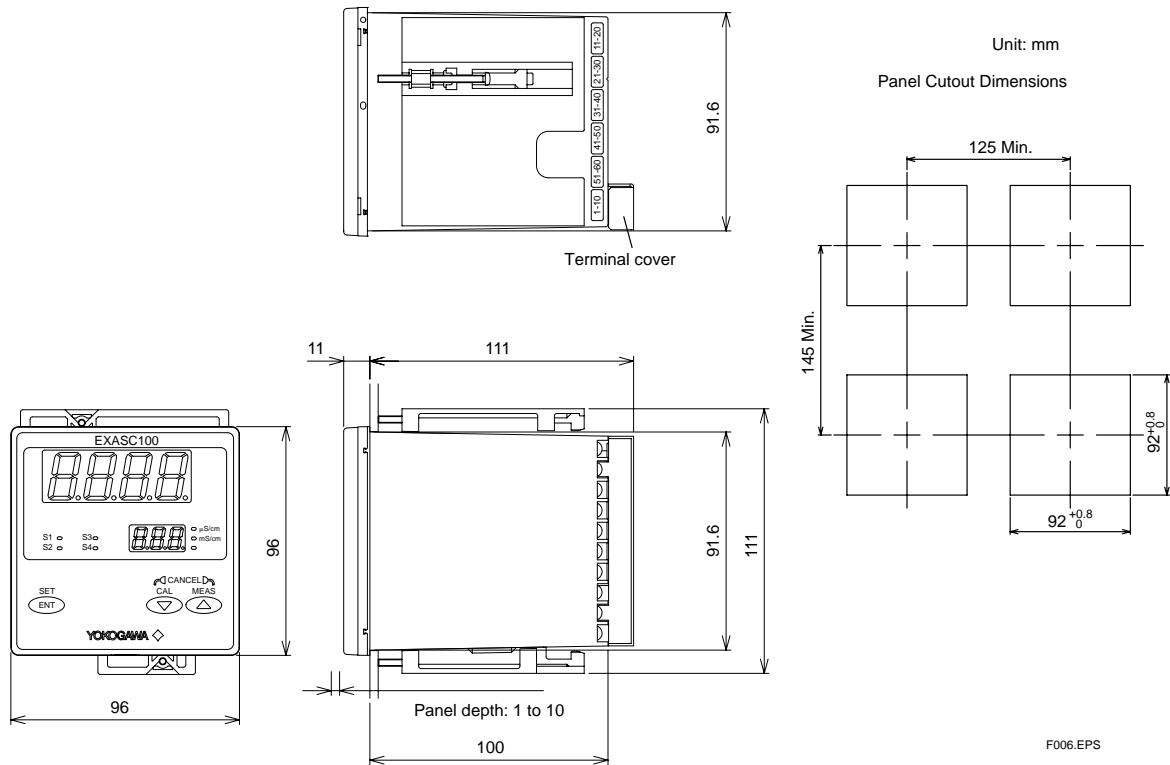


Note: Terminals are M3.5 screws, protective ground terminal is M4 screw.

Caution: Extra care must be taken the making connection between the SC4A, SC4AJ sensor and the SC100 converter since the number marker on each sensor cable conductor does not correspond to the one indicated on the converter's terminal block.

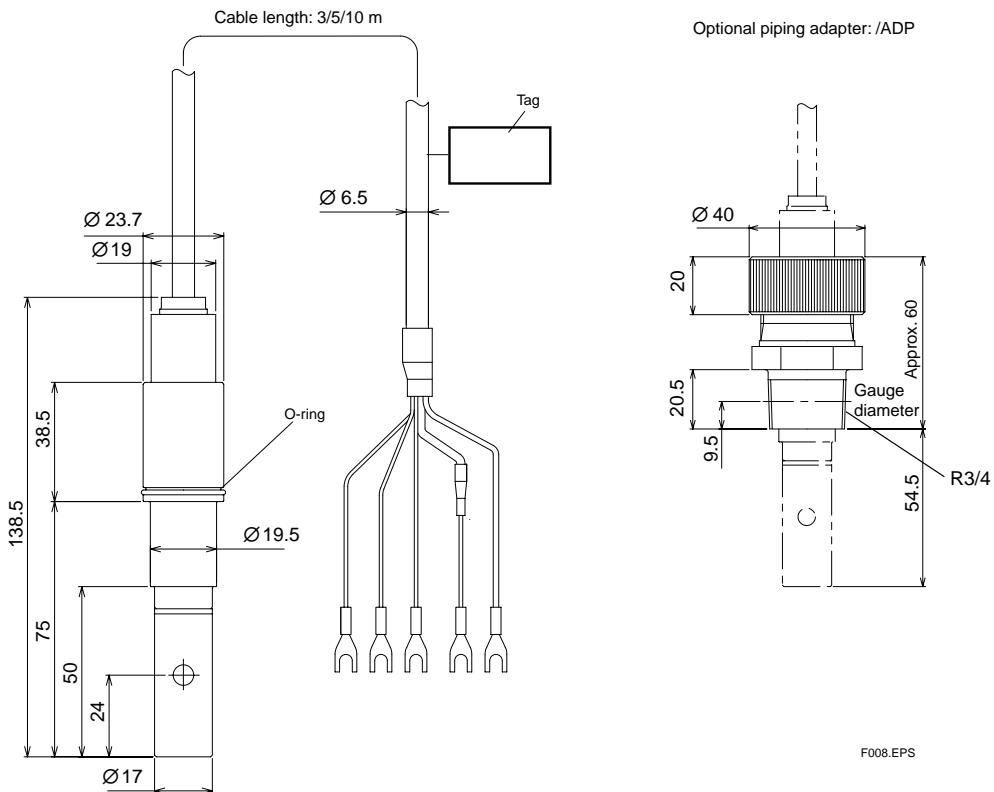
■ Dimensions

1. Panel Mount Conductivity Converter, SC100



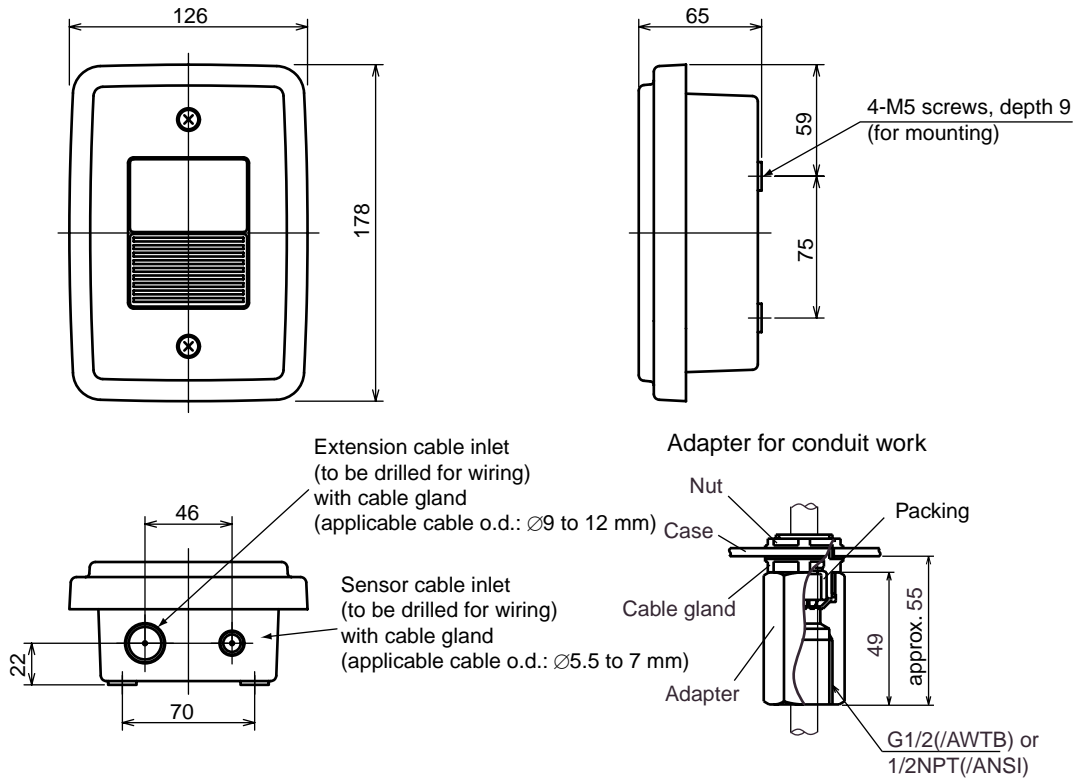
2. Conductivity Sensor for SC100, SC10XB

<SC10XB>



3. Terminal Box for EXA100, WTB100

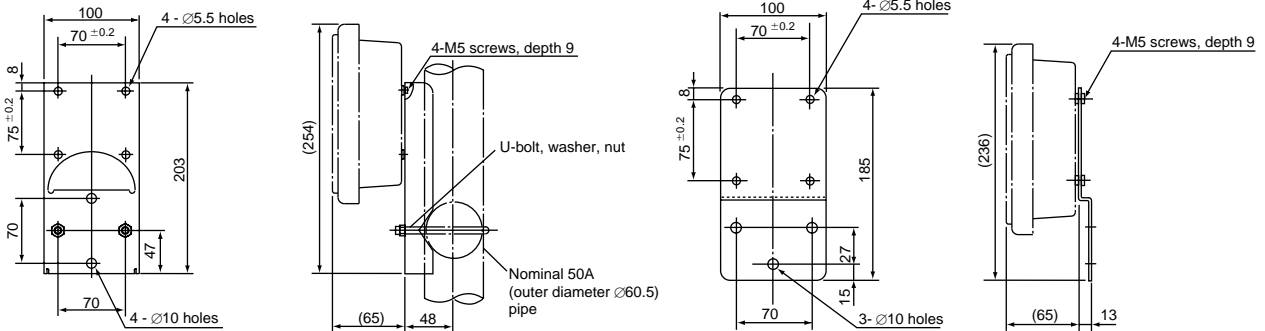
<WTB100-SC>



Note: Conduit adapter is used when the dedicated extension cable is protected by a conduit. Attach it to the cable gland of the converter sensor cable inlet port and the cable gland of the terminal box extension cable.

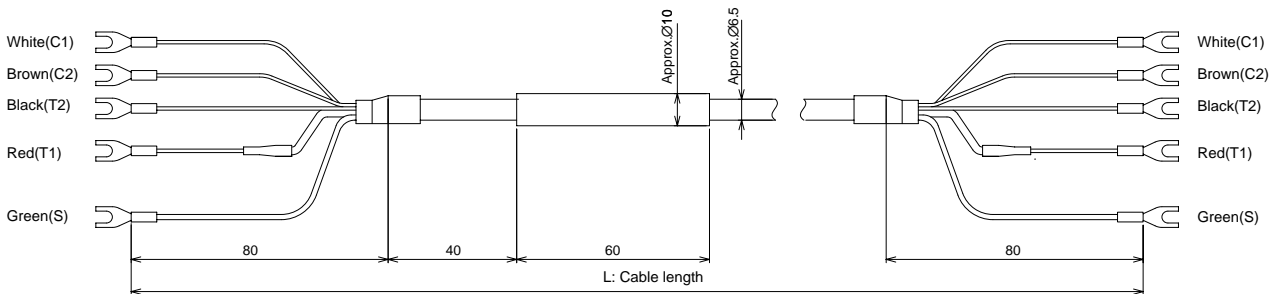
Pip- mounting Bracket (Option code: /P)

Wall- mounting Bracket (Option code: /W)



4. Extension Cable for EXA100, WF100

<WF100-SC>



INQUIRY SHEET FOR PANEL MOUNT CONDUCTIVITY MEASUREMENT SYSTEM

Thank you for your inquiry on our panel mount conductivity measurement system.
Please check the appropriate box and fill in the blanks below.

General Information

Company name : _____
Contact person : _____ Section : _____ Phone : _____
Plant name : _____
Equipment name : _____
Measuring point : _____
Purpose of measurement : Reading Recording Alarm Control
Power supply : _____ VAC, _____ Hz

Measurement Conditions

(1) Sample name : _____
(2) Sample composition : _____
(3) Sample temperature :

Max	Min	Normally	[°C]
-----	-----	----------	------

(4) Sample pressure :

Max	Min	Normally	[kPa]
-----	-----	----------	-------

(5) Flow rate :

Max	Min	Normally	[L/min]
-----	-----	----------	---------

(6) Velocity :

Max	Min	Normally	[m/s]
-----	-----	----------	-------

(7) Presence of slurry or contamination: No Yes
1. _____ Approx. _____ mg/l
2. _____ Approx. _____ mg/l
3. _____ Approx. _____ mg/l
(8) SS concentration : Approx. _____ mg/l
(9) Others : _____

Installation

(1) Ambient temperature : Approx. _____ °C
(2) Installation site : Indoors Outdoors (Please consider another system)
(3) Others : _____

Specification Requirements

(1) Measuring range : _____ to _____ ()S/m _____ to _____ S/m
(2) System configuration : Converter : SC100 Sensor : _____ Holder : _____
 Terminal box : _____ Extension cable : _____
(3) Sensor cable length : 3 m 5 m 10 m _____ m
(4) Sensor operating pressure : Atmospheric pressure
 Higher than atmospheric pressure (up to 500 kPa)
(5) Sensor installation: Direct insertion with piping adapter Others _____
(7) Others _____