# SPEC SHEET

## Digital Indicating Conductivity Meter

AER-102- ECL (Low Concentration)

- 48 x 96 mm, panel mounting type
- Drip-proof/Dust-proof IP66 (for front panel only)
- Power supply 24 V AC/DC (user-specified)
- 2-points Contact output (standard), additional 2 points (optional)
- Proportional control, max. 4 points of relay contact
- Various settings & calibration via software communication (RS-485) (optional)
- Transmission output 2 (optional)

**Name**: Digital indicating conductivity meter

**Model**

| AER - 1 0 | 2 | -EC | L | □ | , □□□ | |
|---|---|---|---|---|---|---|
| Input points | 2 | | | | | 2 points |
| Input | | EC | | | | 2-electrode conductivity sensor (Temperature element: Pt100) (*1) |
| | | | | | | 2-electrode conductivity sensor (Temperature element: Pt1000) (*1) |
| Concentration | | | L | | | Low concentration |
| Power supply voltage | | | | | | 100 to 240 V AC (standard) |
| | | | | 1 | | 24 V AC/DC (*2) |
| Option | | | | | C5 | Serial communication RS-485 |
| | | | | | EVT3 | EVT3, EVT4 outputs (Contact output 3, 4) |
| | | | | | TA2 | Transmission output 2 (*3) |

(*1) This input temperature specification was specified at the time of ordering.
(*2) Power supply voltage100 to 240 V AC is standard.
When ordering 24 V AC/DC, enter 1 in Power supply voltage, after ECL.
(*3) If Transmission output 2 (TA2 option) is ordered, EVT1 is not available.

**Measurement range (Rated scale)**

| Input | | Cell Constant | Scale Range | Resolution | Conductivity Zero Adjustment Value Setting Range |
|---|---|---|---|---|---|
| Conductivity | Conductivity | 0.01/cm | 0.000 to 2.000 μS/cm | 0.001 μS/cm | -0.200 to 0.200 |
| | | | 0.00 to 20.00 μS/cm | 0.01 μS/cm | -2.00 to 2.00 |
| | | | 0.00 to 50.00 μS/cm | 0.01 μS/cm | -5.00 to 5.00 |
| | | | 0.000 to 0.200 mS/m | 0.001 mS/m | -0.020 to 0.020 |
| | | | 0.000 to 2.000 mS/m | 0.001 mS/m | -0.200 to 0.200 |
| | | | 0.000 to 5.000 mS/m | 0.001 mS/m | -0.500 to 0.500 |
| | | | 0.00 to 2.00 mg/L | 0.01 mg/L | -0.20 to 0.20 |
| | | | 0.0 to 20.0 mg/L | 0.1 mg/L | -2.0 to 2.0 |
| | | | 0.0 to 50.0 mg/L | 0.1 mg/L | -5.0 to 5.0 |
| | | 0.1/cm | 0.00 to 20.00 μS/cm | 0.01 μS/cm | -2.00 to 2.00 |
| | | | 0.00 to 50.00 μS/cm | 0.01 μS/cm | -5.00 to 5.00 |
| | | | 0.0 to 500.0 μS/cm | 0.1 μS/cm | -50.0 to 50.0 |
| | | | 0.000 to 2.000 mS/m | 0.001 mS/m | -0.200 to 0.200 |
| | | | 0.000 to 5.000 mS/m | 0.001 mS/m | -0.500 to 0.500 |
| | | | 0.00 to 50.00 mS/m | 0.01 mS/m | -5.00 to 5.00 |
| | | | 0.0 to 20.0 mg/L | 0.1 mg/L | -2.0 to 2.0 |
| | | | 0 to 200 mg/L | 1 mg/L | -20 to 20 |
| | | | 0 to 500 mg/L | 1 mg/L | -50 to 50 |
| | | 1.0/cm | 0.0 to 200.0 μS/cm | 0.1 μS/cm | -20.0 to 20.0 |
| | | | 0.00 to 20.00 mS/m | 0.01 mS/m | -2.00 to 2.00 |
| | | | 0 to 200 mg/L | 1 mg/L | -20 to 20 |
| Temp. (*) | Pt100 or Pt1000 | | 0.0 to 100.0℃ | 0.1℃ | |

(Abbreviation: Temp.: Temperature)
(*) Decimal point place is selectable for temperature input indication.

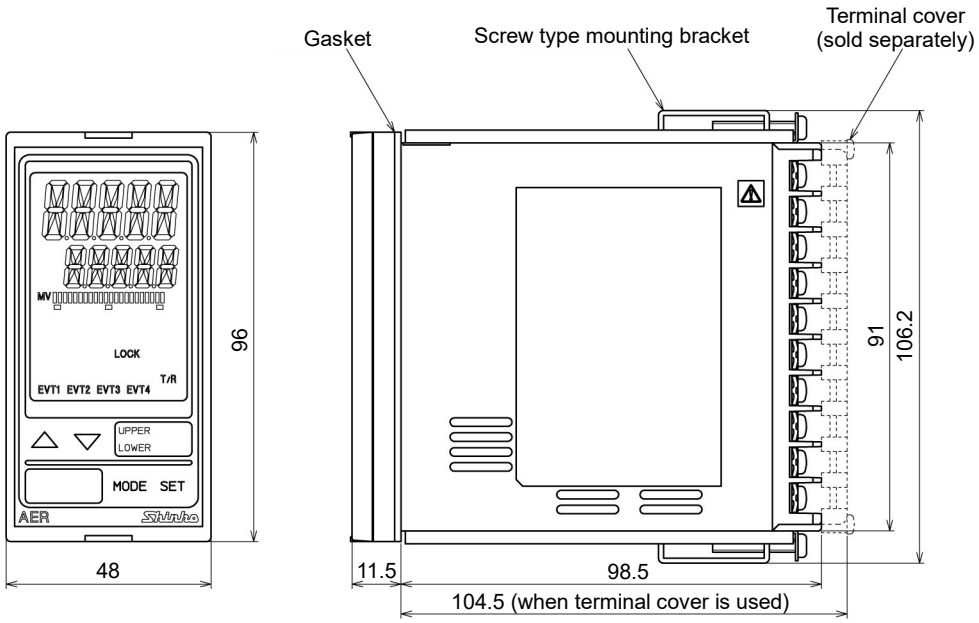
**Repeatability**: Conductivity: ±0.5% of measurement span
TDS conversion: ±1.5% of measurement span

**Linearity**: Conductivity: ±0.5% of measurement span
TDS conversion: ±1.5% of measurement span

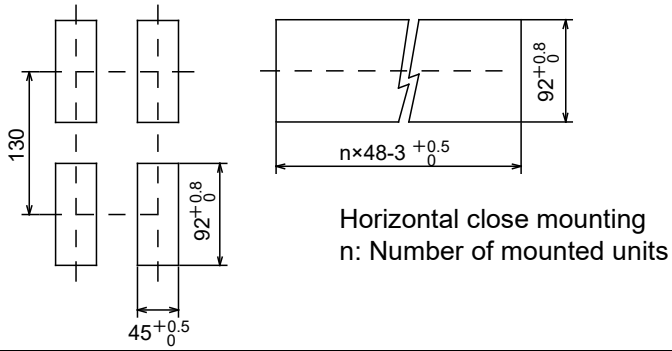
**Indication accuracy**: Temperature: ±1℃

<table>
<tr><td>Conductivity calibration</td><td>Setting range of conductivity Zero adjustment value: Refer to the Measurement range.</td></tr>
<tr><td>Temperature calibration</td><td>Calibration range: -10.0 to 10.0℃</td></tr>
<tr><td>Contact output</td><td>Relay contact: 1a<br>Control capacity: 3 A 250 V AC (Resistive load), 1 A 250 V AC (Inductive load, cos$\phi$=0.4)<br>Electrical life: 100,000 cycles,  Output action: P control, ON/OFF control</td></tr>
<tr><td>Transmission output 1</td><td>Converting conductivity, temperature or MV to analog signal every input sampling period, outputs the value in current. (Factory default: Conductivity)<br>If Transmission output 1 high limit and low limit are set to the same value, Transmission output 1 will be fixed at 4 mA DC.<br>Transmission output can be indicated with the bar graph.<br>Resolution: 12000,  Current: 4 to 20 mA DC (Load resistance: Max. 550 Ω)<br>Output accuracy: Within ±0.3% of Transmission output 1 span</td></tr>
<tr><td>Self-diagnosis</td><td>The CPU is monitored by a watchdog timer, and if an abnormal status occurs, the instrument is switched to warm-up status.</td></tr>
<tr><td>Temperature compensation range</td><td>0.0 to 100.0℃</td></tr>
<tr><td>Ambient temperature</td><td>0 to 50℃ (32 to 122℉)</td></tr>
<tr><td>Ambient humidity</td><td>35 to 85 %RH (Non-condensing)</td></tr>
<tr><td>Power supply (user-specified)</td><td>AER-102-ECL: 100 to 240 V AC 50/60 Hz  Allowable fluctuation range: 85 to 264 V AC<br>AER-102-ECL 1: 24 V AC/DC 50/60 Hz  Allowable fluctuation range: 20 to 28 V AC/DC</td></tr>
<tr><td>Structure</td><td>Flush (Applicable panel thickness: 1 to 8 mm)<br>Case: Flame-resistant resin,  Color: Black,  Front panel: Membrane sheet<br>Drip-proof/Dust-proof: IP66 (for front panel only)</td></tr>
<tr><td>Protection structure</td><td>Overvoltage category Ⅱ, Pollution degree 2 (IEC61010-1)</td></tr>
<tr><td>Safety standards</td><td>RoHS directive compliant</td></tr>
<tr><td>Dimensions</td><td>W48 x H96 x D110 mm, Case depth: 98.5 mm (when mounted through a control panel)</td></tr>
<tr><td>Weight</td><td>Approx. 280 g</td></tr>
<tr><td>Serial communication [C5 option]</td><td>The following operations can be carried out from an external computer.<br>(1) Reading and setting of various set values, (2) Reading of conductivity, temperature and status,<br>(3) Function change and adjustment, (4) Reading and setting of user save area
<table>
<tr><td>Cable length</td><td>1.2 km (max.), Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.)</td></tr>
<tr><td>Communication line</td><td>EIA RS-485</td></tr>
<tr><td>Communication method</td><td>Half-duplex communication</td></tr>
<tr><td>Communication speed</td><td>9600, 19200, 38400 bps (Selectable by keypad)</td></tr>
<tr><td>Synchronization method</td><td>Start-stop synchronization</td></tr>
<tr><td>Code form</td><td>ASCII, Binary</td></tr>
<tr><td>Communication protocol</td><td>Shinko protocol, MODBUS ASCII, MODBUS RTU<br>(Selectable by keypad)</td></tr>
<tr><td>Data bit/parity</td><td>8-bits/No parity, 7-bits/No parity, 8-bits/Even, 7-bits/Even,<br>8-bits/Odd, 7-bits/Odd (Selectable by keypad)</td></tr>
<tr><td>Stop bit</td><td>1, 2 (Selectable by keypad)</td></tr>
<tr><td>Error correction</td><td>Command request repeat system</td></tr>
<tr><td>Error detection</td><td>Parity check, Checksum (Shinko protocol), LRC (MODBUS protocol ASCII), CRC-16 (MODBUS protocol RTU)</td></tr>
</table>
Data Format
<table>
<tr><th>Communication Protocol</th><th>Shinko Protocol</th><th>MODBUS ASCII</th><th>MODBUS RTU</th></tr>
<tr><td>Start bit</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Data bit</td><td>7</td><td>7 (8) (Selectable)</td><td>8</td></tr>
<tr><td>Parity</td><td>Even</td><td>Even (No parity, Odd) (Selectable)</td><td>No parity (Even, Odd) (Selectable)</td></tr>
<tr><td>Stop bit</td><td>1</td><td>1 (2) (Selectable)</td><td>1 (2) (Selectable)</td></tr>
</table></td></tr>
<tr><td>EVT3, EVT4 outputs (Contact output 3, 4) [EVT3 option]</td><td>Same as Contact output.</td></tr>
<tr><td>Transmission output 2 [TA2 option]</td><td>Converting conductivity, temperature or MV to analog signal every input sampling period, outputs the value in current.<br>(Factory default: Transmission output 1: Conductivity, Transmission output 2: Temperature)<br>If Transmission output 2 high limit and low limit are set to the same value, Transmission output 2 will be fixed at 4 mA DC. Transmission output can be indicated with the bar graph.<br>Resolution: 12000,  Current: 4 to 20 mA DC (Load resistance: Max. 550 Ω)<br>Output accuracy: Within ±0.3% of Transmission output 2 span</td></tr>
</table>

Dimensions
(Scale: mm)

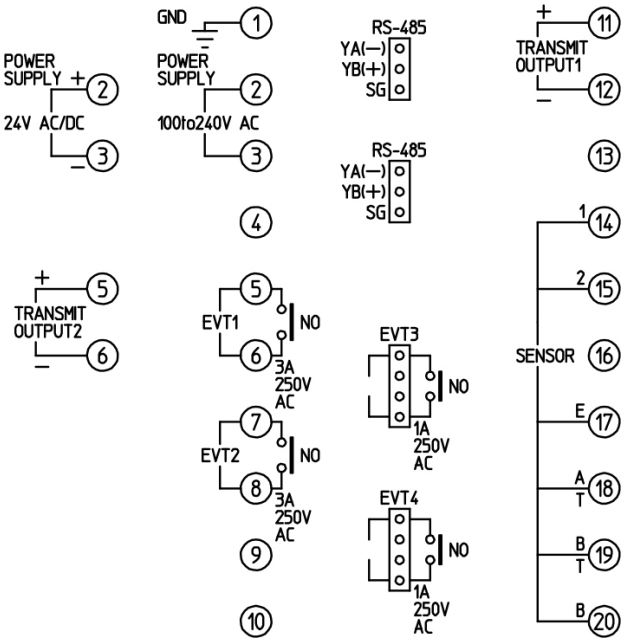



Panel cutout
(Scale: mm)




Horizontal close mounting
n: Number of mounted units

Terminal
arrangement




GND: Ground terminal (①)
POWER SUPPLY: Power terminals (②-③)
EVT1: EVT1 output terminals (Contact output 1) (⑤-⑥)
EVT2: EVT2 output terminals (Contact output 2) (⑦-⑧)
TRANSMIT OUTPUT1: Transmission output 1 terminals (⑪-⑫)
1, 2: Conductivity sensor terminals (⑭-⑮)
E: Shield wire terminal (⑰)
A, B: Temperature compensation sensor terminals
Pt100 (2-wire type), Pt1000 (⑱-⑲)
A, B, B: Temperature compensation sensor terminals
Pt100 (3-wire type) (⑱-⑲-⑳)
When C5 option is ordered:
RS-485: Serial communication
2 connectors are wired internally.
When EVT3 option is ordered:
EVT3: EVT3 output (Contact output 3)
EVT4: EVT4 output (Contact output 4)
When TA2 option is ordered:
TRANSMIT OUTPUT2: Transmission output 2 terminals (⑤-⑥)