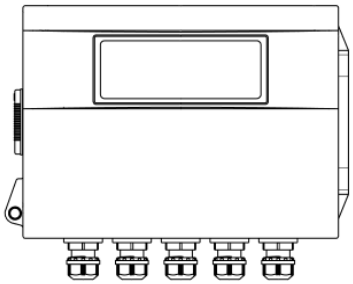
SPEC SHEET

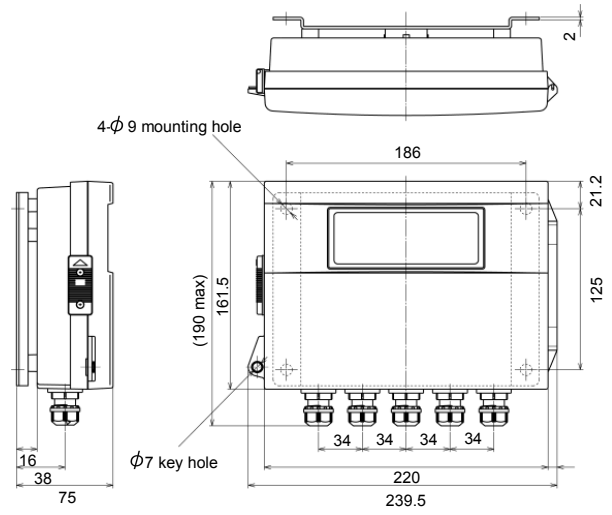
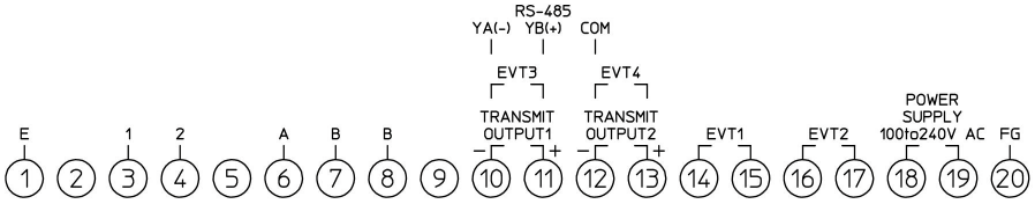
Conductivity Meter for Outdoor Use

FEB-102- ECM (Low Concentration)



- 2-points Contact output (EVT output), 2-points Current output (Transmission output) are standard features.
- Software communication function (RS-485) (Optional)
- Drip-proof/Dust-proof IP65: Suitable for outdoor use

<table>
<tr><td>Name</td><td>Conductivity meter for outdoor use</td></tr>
<tr><td>Model</td><td>
<table>
<tr><th>F E B - 1 0</th><th>2</th><th>-ECM</th><th>, □□□</th><th></th></tr>
<tr><td>Input points</td><td>2</td><td></td><td></td><td>2 points</td></tr>
<tr><td colspan="2">Input</td><td>ECM</td><td></td><td>2-electrode conductivity sensor
(Temperature element: Pt100 or Pt1000)</td></tr>
<tr><td colspan="3">Supply voltage</td><td></td><td>100 to 240 V AC</td></tr>
<tr><td colspan="3" rowspan="3">Option</td><td>C5</td><td>Serial communication RS-485 (*1)</td></tr>
<tr><td>EVT3</td><td>EVT3 output (Contact output 3) (*2)</td></tr>
<tr><td>EVT4</td><td>EVT3, EVT4 output (Contact output 3, 4) (*1)</td></tr>
</table>
(*1) If the C5 option or EVT4 option is ordered, Transmission output 1 and 2 will not be available.
(*2) If EVT3 option is ordered, Transmission output 1 will not be available.
</td></tr>
<tr><td>Rated scale</td><td>
<table>
<tr><th colspan="2">Input</th><th>Cell Constant</th><th>Scale Range</th><th>Resolution</th></tr>
<tr><td rowspan="10">Conductivity</td><td rowspan="10">Conductivity</td><td>0.01/cm</td><td>0.00 to 20.00 μS/cm</td><td>0.01 μS/cm</td></tr>
<tr><td>0.1/cm</td><td>0.0 to 200.0 μS/cm</td><td>0.1 μS/cm</td></tr>
<tr><td>1.0/cm</td><td>0 to 2000 μS/cm</td><td>0.1 μS/cm</td></tr>
<tr><td>0.01/cm</td><td>0.000 to 2.000 mS/m</td><td>0.001 mS/m</td></tr>
<tr><td>0.1/cm</td><td>0.00 to 20.00 mS/m</td><td>0.01 mS/m</td></tr>
<tr><td>1.0/cm</td><td>0.0 to 200.0 mS/m</td><td>0.1 mS/m</td></tr>
<tr><td>0.01/cm</td><td>0.0 to 20.0 mg/L</td><td>0.1 mg/L</td></tr>
<tr><td>0.1/cm</td><td>0 to 200 mg/L</td><td>1 mg/L</td></tr>
<tr><td>1.0/cm</td><td>0 to 2000 mg/L</td><td>1 mg/L</td></tr>
<tr><td rowspan="2">Temperature compensation (*)</td><td>Pt100</td><td rowspan="2">0.0 to 100.0 ℃</td><td rowspan="2">0.1 ℃</td></tr>
<tr><td>Pt1000</td></tr>
</table>
(*) For the temperature indication, decimal point place can be selected.
</td></tr>
<tr><td>Input</td><td>2-electrode conductivity sensor (Temperature element: Pt100 or Pt1000)</td></tr>
<tr><td>Repeatability</td><td>Conductivity: Within ±0.5 % of measurement span
TDS conversion: Within ±1.5 % of measurement span</td></tr>
<tr><td>Linearity</td><td>Conductivity: Within ±0.5 % of measurement span
TDS conversion: Within ±1.5 % of measurement span</td></tr>
<tr><td>Temperature indicating accuracy</td><td>±1 ℃</td></tr>
<tr><td>Input sampling period</td><td>250 ms (2 inputs)</td></tr>
<tr><td>Time accuracy</td><td>Within ±1 % of setting time</td></tr>
<tr><td>EVT output (2 points)</td><td>Setting accuracy: Same as Temperature indicating accuracy
Output action: P control: When proportional band is set to any value except 0
ON/OFF control: When proportional band is set to 0
Output: Relay contact 1a,
Control capacity: 3 A 250 V AC (Resistive load), 1 A 250 V AC (Inductive load cosϕ=0.4),
Electrical life: 100,000 cycles
Action ON delay time: 0 to 10000 seconds
Action OFF delay time: 0 to 10000 seconds</td></tr>
<tr><td>Calibration function</td><td>Conductivity calibration: Perform Conductivity Zero adjustment first, followed by Span adjustment.
Temperature calibration (1 point)</td></tr>
</table>

<table>
<tr><td>Transmission output 1, 2</td><td>Converting conductivity or temperature to analog signal every input sampling period, and outputs the value in current. (The placement of the decimal point place does not follow the selection. It is fixed.)
<table>
<tr><td>Resolution</td><td>12000</td></tr>
<tr><td>Current</td><td>4 to 20 mA DC (Load resistance: Max 550 Ω)</td></tr>
<tr><td>Output accuracy</td><td>Within ±0.3 % of Transmission output span</td></tr>
</table></td></tr>
<tr><td>Serial communication (optional)</td><td>The following operations can be carried out from an external computer.
(1) Reading and setting of various set values
(2) Reading of the conductivity, temperature or status
(3) Function change and adjustment
<table>
<tr><td>Cable length</td><td>1.2 km (Max), Cable resistance value: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on one side.)</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>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>
Communication speed, Synchronization method, Code form, Communication protocol, Data bit/parity and Stop bit are selectable via keypad.</td></tr>
<tr><td>EVT3, EVT4 output (EVT3, EVT4 options)</td><td>Same as EVT output</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>Ambient temperature</td><td>-20 to 50 ℃ (Indicating accuracy is effective within 0 to 50 ℃. Avoid direct sunlight.)</td></tr>
<tr><td>Relative humidity</td><td>35 to 95 %RH (Non-condensing)</td></tr>
<tr><td>Power supply</td><td>100 to 240 V AC 50/60 Hz, Allowable fluctuation range: 85 to 264 V AC, Power consumption: Approx. 10 VA</td></tr>
<tr><td>Mounting</td><td>Wall mounting</td></tr>
<tr><td>Case, Front panel</td><td>Case: Polycarbonate, Color; Metallic gray, Front panel: Membrane sheet</td></tr>
<tr><td>Drip-proof/Dust-proof</td><td>IP65</td></tr>
<tr><td>Safety standards</td><td>RoHS directive conformity</td></tr>
<tr><td>Dimensions (Scale: mm)</td><td>Dimensions: W239.5 x H190 x D75 mm
Weight: Approx. 950 g
 
</td></tr>
<tr><td>Terminal arrangement</td><td> 

E: 2-electrode conductivity sensor shielded wire terminal (①)
1, 2: 2-electrode conductivity sensor terminals (③ - ④)
A, B: Temperature element Pt100 (2-wire), Pt1000 (2-wire) Temperature compensation sensor terminals (⑥ - ⑦)
A, B, B: Temperature element Pt100 (3-wire) Temperature compensation sensor terminals (⑥ - ⑦ - ⑧)
TRANSMIT OUTPUT1: Transmission output 1 terminals (⑩ - ⑪) (Not available if the C5 or EVT3/EVT4 option is ordered)
TRANSMIT OUTPUT2: Transmission output 2 terminals (⑫ - ⑬) (Not available if the C5 or EVT4 option is ordered)
EVT1: EVT1 output (Contact output 1) terminals (⑭ - ⑮)
EVT2: EVT2 output (Contact output 2) terminals (⑯ - ⑰)
EVT3: EVT3 output (Contact output 3) terminals (⑩ - ⑪) (When the EVT3 or EVT4 option is ordered)
EVT4: EVT4 output (Contact output 4) terminals (⑩ - ⑪) (When the EVT4 option is ordered)
RS-485: Serial communication terminals (⑩ - ⑪ - ⑫) (When the C5 option is ordered)
POWER SUPPLY: Power terminal (⑱ - ⑲)
FG: Ground terminal (⑳)</td></tr>
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