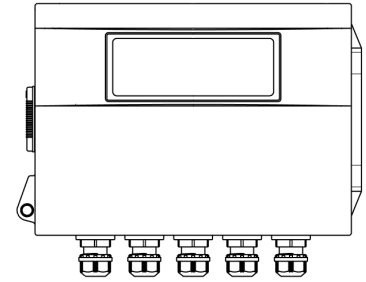# SPEC SHEET

Conductivity Meter for Outdoor Use
FEB-102- ECH (High Concentration)

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

Name	Conductivity meter for outdoor use			
Model	F E B - 1 0	2	-ECH	, ☐☐☐	

Input points	2		2 points
Input		ECH	4-electrode conductivity sensor (Temperature element: Pt100 or Pt1000)
Supply voltage			100 to 240 V AC
Option		C5	Serial communication RS-485 (*1)
		EVT3	EVT3 output (Contact output 3) (*2)
		EVT4	EVT3, EVT4 output (Contact output 3, 4)(*1)

(*1) If 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.

Rated scale

Input			Scale Range	Resolution
Conductivity	Conductivity	Cell constant 1.0/cm	0.00 to 20.00 mS/cm	0.01 mS/cm
			0.0 to 200.0 mS/cm	0.1 mS/cm
			0.0 to 500.0 mS/cm	0.1 mS/cm
			0 to 500 mS/cm	1 mS/cm
			0.000 to 2.000 S/m	0.001 S/m
			0.00 to 20.00 S/m	0.01 S/m
			0.00 to 50.00 S/m	0.01 S/m
			0.0 to 50.0 S/m	0.1 S/m
			0 to 2000 mS/m	1 mS/m
			0.0 to 20.0 g/L	0.1 g/L
			0 to 200 g/L	1 g/L
			0 to 500 g/L	1 g/L
		Cell constant 10.0/cm	0.0 to 200.0 mS/cm	0.1 mS/cm
			0.0 to 500.0 mS/cm	0.1 mS/cm
			0 to 2000 mS/cm	1 mS/cm
			0.00 to 20.00 S/m	0.01 S/m
			0.00 to 50.00 S/m	0.01 S/m
			0.0 to 200.0 S/m	0.1 S/m
			0 to 200 g/L	1 g/L
			0 to 500 g/L	1 g/L
			0 to 2000 g/L	1 g/L
	Seawater salinity		0.00 to 4.00 %	0.01 %
	NaCl salinity		0.00 to 20.00 %	0.01 %
	Temperature compensation (*)	Pt100 Pt1000	0.0 to 100.0 ℃	0.1 ℃

(*) For the temperature compensation indication, decimal point place can be selected.

Input	4-electrode conductivity sensor (Temperature element: Pt100 or Pt1000)
Repeatability	Conductivity: ±0.5 % of measurement span Salinity conversion: ±1 % of measurement span TDS conversion: ±1.5 % of measurement span
Linearity	Same as Repeatability
Temperature indicating accuracy	±1 ℃
Input sampling period	250 ms (2 inputs)
Time accuracy	Within ±1 % of setting time
EVT output (2 points)	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

Calibration function	Conductivity calibration: Perform Conductivity Zero adjustment first, followed by Span adjustment. Temperature calibration (1 point)
Transmission output 1, 2	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.)

	Resolution	12000
	Current	4 to 20 mA DC (Load resistance: Max 550 Ω)
	Output accuracy	Within $\pm$ 0.3 % of Transmission output span

Serial communication (C5 option)	The following operations can be carried out from an external computer. (1) Reading and setting of various set values (2) Reading of the conductivity, salinity conversion, temperature and status (3) Function change and adjustment

	Cable length	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.)
	Communication line	EIA RS-485
	Communication method	Half-duplex communication
	Error correction	Command request repeat system
	Error detection	Parity check, Checksum (Shinko protocol), LRC (Modbus protocol ASCII), CRC-16 (Modbus protocol RTU)

Communication speed, Synchronization method, Code form, Communication protocol, Data bit/parity and Stop bit are selectable via keypad.

EVT3, EVT4 output (EVT3, EVT4 options)	Same as EVT output
Self-diagnosis	The CPU is monitored by a watchdog timer, and if an abnormal status occurs, the instrument is switched to warm-up status.
Ambient temperature	-20 to 50 ℃ (Indicating accuracy is effective within 0 to 50 ℃. Avoid direct sunlight.)
Relative humidity	35 to 95 %RH (Non-condensing)
Power supply	100 to 240 V AC 50/60 Hz, Allowable fluctuation range: 85 to 264 V AC, Power consumption: Approx. 10 VA
Mounting	Wall mounting
Case, Front panel	Case: Polycarbonate, Color; Metallic gray, Front panel: Membrane sheet
Drip-proof/Dust-proof	IP65
Safety standards	RoHS directive conformity
Dimensions (Scale: mm)	Dimensions: W239.5 x H190 x D75 mm Weight: Approx. 950 g
Terminal arrangement	

E: 4-electrode conductivity sensor shielded wire terminal (①)
1, 2, 3, 4: 4-electrode conductivity sensor terminals (② - ③ - ④ - ⑤)
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)