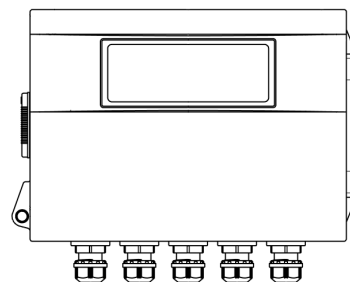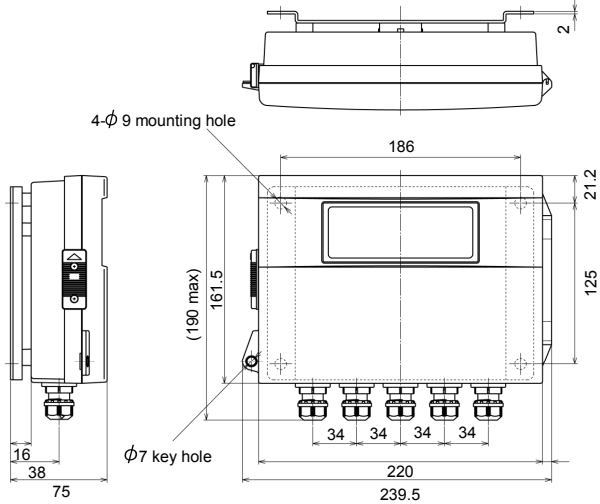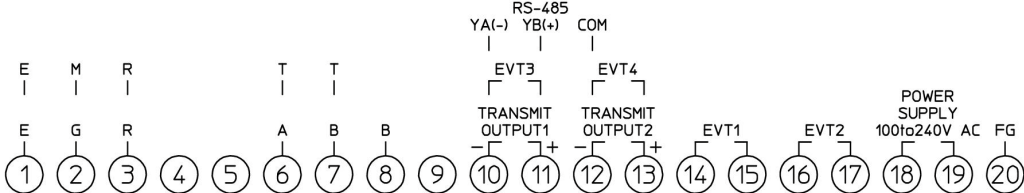# pH/ORP Meter for Outdoor Use
FEB-102-PH

- pH meter and ORP meter selectable via keypad
- 2-points Contact output (EVT output) and 2-points Current output
  (Transmission output) are standard features.
- Software communication (RS-485) (Optional)
- Cleansing output function equipped
- Drip-proof/Dust-proof IP65: Suitable for outdoor use

Name	pH/ORP meter for outdoor use		
Model	F E B - 1 0	2	-PH , ☐☐☐	

	Input points	2		2 points
	Input		PH	pH combined electrode sensor (Cu500/25 ℃, Pt100 or Pt1000) ORP combined electrode sensor (*1)
	Supply voltage			100 to 240 V AC
	Option		C5	Serial communication RS-485 (*2)
			EVT3	EVT3 output (Contact output 3) (*3)
			EVT4	EVT3, EVT4 output (Contact output 3, 4) (*2)

(*1) Available if ORP☐☐☐ (ORP meter) is selected in [Model selection].

(*2) If the C5 or EVT4 option is ordered, Transmission output 1 and 2 will not be available.

(*3) If the EVT3 option is ordered, Transmission output 1 will not be available.

Rated scale

Input		Scale Range	Resolution
pH combined electrode sensor		0.00 to 14.00 pH	0.01 pH
ORP combined electrode sensor		-2000 to 2000 mV	1 mV
Temperature compensation	No temperature compensation		
	Pt100		
	Pt1000	0.0 t 100.0 ℃	0.1 ℃
	Cu500		

Input	pH combined electrode sensor (pH sensor: JIS Z8802, Temperature element: Cu500/25 ℃, Pt100 or Pt1000) ORP combined electrode sensor (Temperature element: Cu500/25 ℃, Pt100 or Pt1000)
Repeatability	pH meter: ±0.05 pH, ORP meter: Within ±5 mV (at equivalent input)
Linearity	pH meter: ±0.05 pH, ORP meter: Within ±5 mV (at equivalent input)
Temperature indicating accuracy	±1 ℃
Input sampling period	125 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	2-points pH calibration (Auto, manual calibration) using standard solutions. Standard solution: pH 2, 4, 7, 9, 10 (JIS) Temperature calibration (1 point)
Cleansing output	Cleansing output mode: An EVT output (for which the cleansing output is selected) will turn ON during the configured cleansing time. Manual cleansing mode: During Manual cleansing mode, cleansing action is performed using the 'Cleansing time' and 'Restore time after cleansing' settings. After cleansing action is finished, the unit automatically reverts to Cleansing output mode.
Transmission output 1, 2	Converting pH, temperature or ORP value 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 ±0.3 % of Transmission output span

Serial communication (optional)	The following operations can be carried out from an external computer. (1) Reading and setting of various set values (2) Reading of pH, temperature, ORP value or 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: pH combination electrode sensor shielded wire terminal (①) G, R: pH combination electrode sensor terminals (② - ③) E: ORP combination electrode sensor shielded wire terminal (①) M, R: ORP combination electrode sensor terminals (② - ③) T, T: Temperature element Cu500 (2-wire) Temperature compensation sensor terminals (⑥ - ⑦) 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)