

Slim Power Meter User Manual

WMS-PE2D□

watanabe
Watanabe Electric Industry Co. Ltd.

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1. Handling Precautions

Please be sure to follow the instructions for proper and safe use of this instrument.



Usage Restrictions

- **Do not use this instrument as part of a device that is scheduled to perform life support for the human body.**
- **Do not use the device in a way that directly leads to personal injury or property damage if this device fails.**

○Precautions for use

1-1. Usage Environment and Conditions

- Do not use in the following locations as it may lead to malfunction or reduced lifespan.
 - (1) Locations where the ambient operating temperature exceeds the range of -5 to 55°C
 - (2) Locations where the ambient operating humidity is 90% RH or higher, or where freezing or condensation occurs.
 - (3) Locations with a lot of dust or metal particles (Requires a dust-proof enclosure and heat dissipation measures).
 - (4) Locations with high levels of corrosive gas, salt, or oil smoke.
 - (5) Locations where vibration, shock concerns, or effects exist.
 - (6) Locations where rain or water droplets may contact the device.
 - (7) Locations with strong electromagnetic fields or high external noise.
 - (8) Locations close to fire sources.
- There is a possibility that the device may not operate normally if affected by radio waves or noise emitted from other electronic equipment. Please ensure thorough evaluation in advance before using the device.

1-2. About installation and connection

- Please check the connection method before installation and connection, and have a person with specialized skills install and connect.
- Do not wire power supply lines, input signal lines, and communication lines near sources of noise or relay drive lines.
- Bundling with lines that are superimposed on noise or storing them in the same duct may cause communication abnormalities.
- The area around the line where noise is superimposed may cause communication abnormalities.
- This instrument can be used almost at the same time as the power is turned on, but it needs to be energized for 30 minutes to satisfy all performance.



Caution

- About this instrument
 - This device requires the connection of current and voltage for power measurement. Ensure the correct sequence of voltage for each phase (E.g., R, N, S, T) and the proper direction (K, L, k, l) and phase for current attachment. Incorrect CT direction, placement, or sequence will result in inaccurate measurements.
 - This device requires a power supply. The power input is shared with the voltage input. For equipment and circuit protection, the installation of a breaker or fuse is recommended.
 - This device will not perform measurements unless the power /voltage input is supplied.
 - Ensure all connections are made according to the connection diagram. Improper connections may result in equipment failure, fire, or electric shock.
 - Do not perform live-line work. This can cause electric shock accidents or equipment failure, burning, and fire due to short circuits.
 - Grounding should be performed using D-type grounding (formerly referred to as Type 3 grounding). Insufficient grounding may lead to malfunction.

- Use appropriate standard wires. Using unsuitable wires may cause heating and lead to fire hazards.
- Use crimp terminals that match the wire specifications. Using inappropriate terminals can result in disconnections or poor contact, causing equipment malfunction, failure, burning, or fire hazards.
- After tightening screws, ensure there are no forgotten screws left untightened. Failure to tighten screws may lead to equipment malfunction, fire, or electric shock.
- Excessive tightening of screws may damage terminals or screws, while insufficient tightening may lead to equipment malfunction, fire, or electric shock.
- About inverters
 - The power measurement function of this instrument is intended for measurement of 50/60Hz sinusoidal circuits. Since it is not possible to accurately measure the power of an inverter-controlled power supply circuit (a circuit in which the frequency or voltage waveform is not a sinusoidal wave exceeding the range of 45–65Hz), measure the primary power supply circuit (50/60Hz) of the inverter when measuring the power of the inverter circuit.
- About CT
 - Please avoid construction work in a live state. Doing so may result in an electric shock accident or CT damage.
 - Since the protection element is built into the secondary side of the split CT, it is possible to construct with the secondary side open, but if the release state continues for a long time, the protection element may deteriorate, so do not open the secondary side for a long time while the primary side is live.
- About VT
 - Only AC110/220 V can be connected to the voltage input circuit of this unit (up to 220 V with a voltage between 1 and 2 in the single-phase 3-wire). Voltages exceeding 220 V (440 V–6600 V, etc.) cannot be input directly, so please use VT (PT) in that case.
- Others
 - For FG (Frame Ground), use direct grounding to the ground in areas where noise generation is high, and type D grounding in places where noise is not generated.
 - Do not use this unit after disassembling or modifying it. Failure to do so may result in malfunction, electric shock, or fire.
 - This instrument is a precision measuring instrument, so please handle it with care so as not to apply a strong impact due to dropping.

1-3. Contents of "Warnings" and "Cautions"

 Caution	This indication states that if it is mishandled, "it is assumed that there is a possibility of injury and only material damage will occur."
 Warning	This indication states that if mishandled, death or serious injury is expected.

Warning

- About this instrument
 - 1 Do not perform live-line work. It may cause electric shock, equipment failure, overheating, or fire.
 - 2 Do not disassemble or modify this device. It may cause malfunction, electric shock, or fire.

1-4. About checking before use

- Please use the installation location in accordance with the usage environment and operating conditions.
 - Check the power supply rating (voltage, frequency, contact capacity, etc.).
 - After installation, it is necessary to set the operation using the LED display on the front of the main unit and the operation switch or Master device.
- If the settings are incorrect, it will not work properly.

1-5. How to use

- This instrument is not a test instrument. It cannot be used as a transaction instrument or certification instrument as defined by the Measurement Law.
- Please use within the scope of the specifications described in this manual. Use outside the specified range may not only cause malfunction or equipment failure, but may also cause fire or burnout.
- Do not remove the label on the product itself. If the label is removed, we cannot guarantee it.
- Do not use chemicals or cleaning agents containing solvents such as paint thinner, benzene, or alcohol.

1-6. Maintenance and Inspection

- In order to use this instrument correctly and for a long time, perform the following inspections regularly.
 - (1) Is there any damage to the product?
 - (2) Is there any abnormality in the display?
 - (3) Is there any abnormal sound, smell, or fever?
 - (4) Is there any looseness in the installation and terminal termination?
- Please pay attention to the following points when testing the power supply relay.
 - (1) The power supply terminal and the FG pin have a withstand voltage of 2000 V for 1 minute, but since they are coupled with capacitors, a current of less than 5 mA flows. If there is a risk that current will flow during the relay test and affect other equipment, make sure that no voltage is applied between the power supply terminal and the FG terminal.
 - (2) The allowable excessive input of the power measurement input is stipulated as follows, so when performing a relay test, please perform it within the range that does not exceed this regulation.

Voltage		Electric current	
Input	Input time	Input	Input time
Rated 120%	Continuous	Rated 120%	Continuous
Rated 150%	For 10 seconds	Rated 200%	For 10 seconds

1-7. About disposal

- The products listed in this manual should be properly disposed of as general industrial waste in accordance with the ordinances of each local government.

1-8. About Exports

- Our products are developed and manufactured for use in Japan.
- We do not guarantee compliance with overseas laws and regulations.
- When exporting this instrument, it is the responsibility of the exporter to follow the necessary procedures in accordance with the export laws and regulations of Japan and related foreign countries.
- This product may not be exported or sold to countries, organizations, corporations, or individuals subject to sanctions or trade embargoes by Japan and other related countries.
- The technology related to this instrument cannot be used for military purposes such as the development of weapons of mass destruction, or for other equipment whose manufacture, use, sale, or procurement are prohibited by domestic and foreign laws and regulations.

2. Guarantee

2-1. Warranty period

The warranty period of this instrument is one year after delivery.

2-2. Warranty Coverage

If a malfunction occurs due to our fault within the warranty period, we will provide a replacement or repair the defective product free of charge.

However, if the cause of the failure falls under the following, it will be excluded from the scope of this warranty.

- (1) When the product is used in a manner that deviates from the conditions, environment, and handling described in this User's Manual and the instruction manual included with the product.
- (2) In the event of modification or repair of the structure, performance, specifications, etc. by someone other than the Company.
- (3) When caused by causes other than this device
- (4) When it could not be foreseen at the level of science and technology at the time of shipment by the Company.
- (5) In the event of other causes not the responsibility of the Company, such as natural disasters, disasters, force majeure, etc.

The warranty referred to here is limited to the instrument itself, and damage caused by the failure or defect of the instrument shall be excluded from the scope of the warranty.

2-3. Limitation of Liability

Under no circumstances shall the Company be liable for any damage caused by this instrument.

3. Ordering Code

3-1. List of models

Please ensure that the delivered product matches the ordered product model.

In order to measure power with this device, a specialized CT and CT connection cable, sold separately, are required.

Please confirm the availability of the specialized CT and CT connection cable.

Format: **WMS-PE2** □□-00 A 0 00

Series	Type	Option	Communication	Power	Test report	Suffix code	substance
WMS							RS-485 slave
	PE2						Slim Power Meter
		DI					2ch Digital Input
		DO					2ch Digital Output
			00				Standard (Modbus RTU)
				A			AC100–240 V (50/60Hz)
					0		None
					1		With Test report
						00	Standard

Table 3-1 Ordering code

3-2. Optional items (sold separately)

Name	Model	Specification
Dedicated split CT	CTL-10CLS9-00 WCTF-100 A-K WCTF-200 A-K WCTF-400 A-K WCTF-600 A-K	5A/50 A Shared Split CT 100 A split CT (connector pull-out wire included) 200 A split CT (connector pull-out wire included) 400 A split CT (connector pull-out wire included) 600 A split CT (connector pull-out wire included)
CT connection cable (2 m)	CTL-BUN-2P	Cable to be connected to two CT into one Required for combination of CT1/CT2 and CT3/CT4
CT extension cable (3m)	CTL-EN-03	Up to 3 can be connected and extended (Max. 11 m in combination with CT connection cable)

Table 3-2 Optional Accessories

4. Main Unit Specifications

4-1. Basic Specifications

Operating temperature and humidity range	Temperature	-5~+55°C
	Humidity	10%~90%RH (Non-condensing, non-freezing)
Storage temperature and humidity range	-20~+60°C, 90%RH (Non-condensing, non-freezing)	
Warm-up time	30 minutes after power -ON (After warm-up, measurement accuracy capability guaranteed)	
Power supply voltage	AC100~240 V(50/60Hz)	
Input voltage range	85%~110% of rated voltage	
Power Consumption	AC power supply: Approx. 2.5 VA (AC110 V), Approx. 3.6 VA (AC220 V)	
Isolation	'Isolation between following terminals. 1) FG (Frame ground) terminal 2) Power and voltage input terminals 3) CT input terminals 4) Digital output / input terminals 5) Communication terminal (RS-485)	
Insulation Resistance	100 MΩ or more at 500 V DC	
Dielectric strength	2000 V AC / 1 min	
Dimensions & Weight	90(H)×22.5(W)×70.5(D) mm, approx. 100g	
Mounting method	DIN rail mount	
Termination	FG terminal, power supply and voltage input	5.08 mm Pitch Detachable Screw Terminal 5P Recommended lead size: wire diameter 0.2~2.5 mm ² Stripping length: 7~8 mm M2.5 screw tightening torque: 0.5 N·m
	CT Input	Dedicated connection cable connector
	Digital output OR Digital Inputs	3.5 mm Pitch Detachable Screw Terminals 5P Recommended lead size: wire diameter 0.2~1.5 mm ² Stripping length: 6~7 mm M2 screw tightening torque: 0.2 N·m
	Recommended Bar Terminals	When using stranded wire for wiring, it is recommended to use rod terminals with insulated covers (DIN46228-4 compliant products). Recommended bar terminal: AI0.34-8TQ (for AWG22) AI0.5-8WH (for AWG20) Crimping tool: CRIMPFOX6 * All made by Phoenix Contact Co., Ltd.
Case material and color	Self-extinguishing polycarbonate black PC EFR3000 BK	
	Flame retardant grade: UL94V-0	

4-2. Power Metering Specifications

Number of inputs	Current (CT) : 4 channels, Voltage (VT) : 1 circuit
Electrical systems	Switchable via front panel display Single-phase 2-wire / Single-phase 3-wire / Three-phase 3-wire / Three-phase 4-wire
Input Frequency	50 / 60 Hz, universal

Input Rating	Voltage: Depending on each Electrical systems, you can choose from the following. • Single-phase 2-wire AC110 V/220 V • Single-phase 3-wire AC110 V (AC220 V between 1-2) • Three-phase 3-wire AC110 V/220 V • Three-phase 4-wire AC110 V/220 V Current: Input with a dedicated CT with the following ratings (ratings can be selected from the following 6 ranges) • AC5A/AC50 A/AC100 A/AC200 A/AC400 A/AC600 A	
Setting range for external VT and CT	External VT rating Setting range: 110–77,000 V (must be set according to VT ratio) External CT Rating Setting Range: 5–9,999 A In the case of 5ACT, it can be combined with an external CT in a two-stage configuration.	
Measurement Elements	single-phase 2-wire	Current, voltage, Active power, Reactive power (instantaneous value/Max./Min. value), Active energy amount (power received/transmitted), Reactive energy amount (Delayed power received/received advanced/delayed transmission/power transmission advanced), power factor (Each instantaneous value/Max./Min. value), frequency(Each instantaneous value/Max./Min. value), converted
	single-phase 3-wire	1-phase current, 2-phase current, N-phase current (Each instantaneous value/Max./Min. value), 1-N voltage, 2-N voltage, 1-2 voltage (Each instantaneous value/Max./Min. value), Active power, Reactive power (Each instantaneous value/Max./Min. value), Active energy (power reception/transmission), Amount of Reactive power (Delay in receiving / proceeding with power reception / delay in transmission / progress in transmission), power factor (Each instantaneous value/Max. value/Min. value), frequency (Each instantaneous value/Max. value/Min. value), conversion value
	three-phase 3-wire	R-phase current, T-phase current, S-phase current (Each instantaneous value/Max./Min. value), R-S voltage, S-T voltage, T-R voltage (Each instantaneous value/Max./Min. value), Active power, Reactive power (Each instantaneous value/Max./Min. value), Active energy (power received/transmitted), Amount of Reactive power (Delay in receiving / proceeding with power reception / delay in transmission / progress in transmission), power factor (Each instantaneous value/Max. value/Min. value) Frequency (instantaneous value/Max./Min. value), converted value
	three-phase 4-wire	R-phase current, T-phase current, S-phase current, N-phase current (Each instantaneous value/Max./Min. value), R-S voltage, S-T voltage, T-R voltage (Each instantaneous value/Max./Min. value), R-N voltage, S-N voltage, T-N voltage (Each instantaneous value/Max./Min. value), Active power , Reactive power (Each instantaneous value/Max./Min. value), Active power amount (power received/transmitted), Reactive power amount (Delayed power received/forward/delayed transmission/power advanced), power factor (Each instantaneous value/Max./Min. value), frequency (Each instantaneous value/ Max./Min. Value), Converted Value
Display Elements	Voltage, current, Active power, Reactive power, power factor, Active energy (power received), conversion value. * In the case of PE2DI, ON-Time Totalization and Pulse Totalization are additionally displayed.	
Allowable overload input	Voltage	120% continuous, 150% for 10 seconds
	Current	120% continuous, 200% for 10 seconds
Calculation method	Current & Voltage	RMS arithmetic method

	Active power, Reactive power	Time-division multiplication calculation method
	Power factor	Calculated from Active power and Reactive power by the following formula $\text{Power factor} = \frac{\text{Active Power}}{\sqrt{(\text{Active power}^2 + \text{Reactive power}^2)}}$
	Frequency	Zero-crossing period calculation method
Low cut	Current	Rated 0.0–9.9% can be set (initial value 0.1%)
Measuring range	Current	Low-cut setting value – Rated 120% (0 for less than the low-cut setting value)
	Voltage	Rated 10–120%
	Active power	Rated 0–144% ± 0 for less than 0.4% * The rated value of the Active power in each phase line category is calculated as follows. Single-phase 2-wire rating "External CT rating" × "External VT rating" Single-phase 3-wire rating "External CT rating" × "External VT rating" × 2 Three-phase 3-wire rating "External CT rating" × "External VT rating" × √ 3 Three-phase 4-wire rating "external CT rating" × "external VT rated line inter" × √ 3
	Active energy	Cumulative up to 999,999,999.999 kWh (1000 GWh) When the above values are accumulated, it overflows and resumes from 0.000 kWh. If the frequency is outside the measurement range, it will not be accumulated.
	Reactive power	Rated 0–144% ± 0 for less than 0.4% * The rated value of the Active power in each phase line category is calculated as follows. Single-phase 2-wire rating "External CT rating" × "External VT rating" Single-phase 3-wire rating "External CT rating" × "External VT rating" × 2 Three-phase 3-wire rating "External CT rating" × "External VT rating" × √ 3 Three-phase 4-wire rating "external CT rating" × "external VT rated line inter" × √ 3
	Amount of Reactive energy	Accumulate up to 999,999,999.999 kVarh (1000 GWh) When accumulated to the above value, it overflows and resumes from 0.000 kVarh. If the frequency is outside the measurement range, it will not be accumulated.
	Power Factor	Power factor: -0.00%– 100.0%– + 0.00% When in an unmeasured state, the power factor is treated as 100%.
	frequency	44.2–65.8Hz
Tolerance	● In normal measurement mode (when measuring power by input of current or voltage)	
	Active power	±1.0% FS (cosφ=0.5–1)
	Reactive power	±1.0% FS (cosφ=0–0.866)
	Active energy	±1.0% FS (cosφ=1) ±1.5% FS (cosφ=0.5)
	Amount of Reactive energy	±1.0% FS (cosφ=0) ±1.5% FS (cosφ=0.866)

	Current & Voltage	±1.0% FS (in equilibrium)
	Power factor	±2.0% FS (cosφ=0.5–1) * For both forward and backward movements, voltage rating current 20% FS or more at equilibrium
	frequency	Rated ± 1.0% (P1-P2 voltage 40% fs or more)
	● In Voltage-less measurement mode (During provisional current measurement using current only)	
	Active power	* The accuracy of the measurement results is not guaranteed. Please use it as a reference value.
	Reactive power	
	Active energy	
	Amount of Reactive energy	
	electric current	±1.0% FS (in equilibrium)
	Voltage & Power factor	This is the value set as the External VT rating and virtual power factor.
Effect of ambient temp.		0.01%/°C

4-3. Digital Output Specifications

Output Signal	NPN Open Collector
Output Rating	DC 30 V 50 mA
Output Operation	Totalized pulse *2, alarm output, communication control output
Pulse Totalization Output Element	Received Active energy
Pulse Totalization Output width	Selectable from 100 ms/250 ms/500 ms/1000 ms
Unit Pulse Weights	Available from 0.001 kWh/0.01 kWh/0.1 kWh/0.5 kWh/1 kWh/10 kWh/100 kWh
Alarm Operation Output Element	Active power, phase current
Number of outputs	2 points
Output Common	1 common for every 2 outputs
Communication control output operation *1	Normal output, inverting output, one-shot output, start/stop output * Stop/stop output is in units of 2 CH

*1 Output operation that can only be controlled from communication.

The "Totalized pulse output" and "alarm" operations of the output point that is being controlled by communication are stopped.

*2 In the case of Totalized pulse output, the output element of each circuit can be assigned to the same DO pin.

In that case, the output elements of each circuit are added together and digital/pulse output.

4-4. Digital Input Specifications

Input Signal	Pulse/non-voltage contacts or transistors
Measurement items	Pulse Totalization, ON/OFF state, ON-Time Totalization [minutes]
Input Sense Current	Approx. 5 mA (when the ON resistance is 0 Ω)
Input pull-up voltage	DC24V±10% (internal pull-up)
Input pulse ON-Time	10 ms or more
Input pulse OFF time	10 ms or more
Pulse Input Frequency	50Hz or less
Number of inputs	2 points
Input Common	Minus common (1 common for every 2 inputs)

4-5. Switch Specifications

Up/down switch	Up and down button switches (2 in total on the front display) Used for selection of each display item and Setting and numerical operation.
ENTER switch	Button switch (1 on the front display) - Confirm various settings and selections. - Used to transition between measurement mode $\Leftrightarrow$ setting mode.
MODE/Right switch	Button switch (1 on the front display) - Used for transitioning display items and selecting columns. - Used to transition between setting mode $\Rightarrow$ measurement mode.

4-6. Display Specifications

7SEG numeric display	Green LED	It is used for measurement value display and setting operation. (Character height: approx. 7 mm, 4 digits $\times$ 2 columns)
Digital Output or Digital Input	Green LED	Lights up synchronously with Digital output or Digital input
10 to the power of 3	Green LED	Append $\times 10^3$ to the displayed value. Flashing during simulated I/O
Unit display (A, V, kW, kVar, kWh, PF)	Green LED	Indicates the unit of the displayed value.
PWR LED	Green LED	Indicates that the instrument is powered on. •Lights up in measurement mode •Flashes in setting mode
ERR LED	Red LED	Indicates that an error has occurred.
NET LED	Green LED	Indicate that it is in a communication state.

4-7. Communication Specifications

Protocol	Modbus(RTU)
Baud rate	19200 bps (factory), 4800, 9600, 38400 bps
Communication method	Semi-duplex system
Synchronization method	asynchronous
Termination Resistor	Approx. 120 Ω (Enabled by enabling dip SW on the front of the main unit)
Number of connected devices	31
Transmission distance	1200 M or less (variable depending on the connected device and transmission line)
Forms of communication	1:N communication
Transmission Format	Data length: 8 bits (fixed)
	Parity: None/Odd/Even
	Stop bit: 1 bit (fixed, 2 bits only without parity)

5. Name of each part

5-1. Description of appearance

This section describes the appearance of the instrument, as well as the terminal arrangement, switches, and displays.

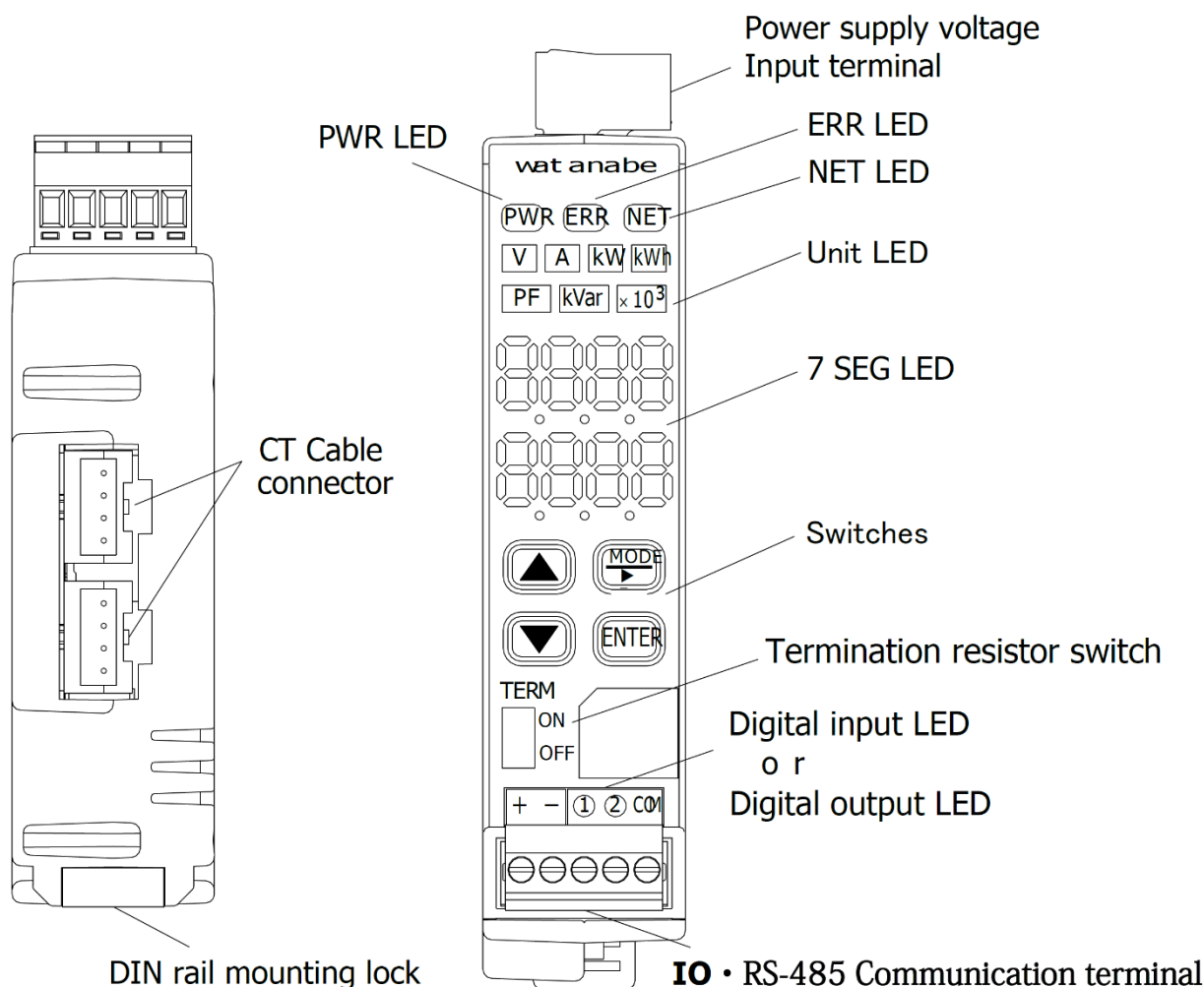


Diagram 5-1 Description WMS-PE2D□

Name	color	Overview
7SEG LED	Green	Displays measured values, status, and operating settings.
Digital Input LED*1	Green	Lights up synchronously to the Digital input.
Digital Output LED*1		It flashes synchronously to the Digital output.
Unit LED(A,V,Kw,kVar,kWh,PF)	Green	Indicates the unit of display value.
POWER LED	Green	Indicates that the instrument is powered on.
ERR LED	Red	Indicates that an error has occurred.
NET LED	Green	Indicate that it is in a communication state.

*1 If the model is WMS-PE2DI, it will be a Digital input, and if it is WMS-PE2DO, it will be a Digital output.

Name	Overview
Operation SW	It is used to operate the instrument, such as setting the operation
Termination resistor SW	Termination Resistor (120Ω) Enable/Disable SW
Power supply and voltage input terminal blocks	Voltage input and FG wiring for operating power supply and power measurement (power supply and voltage input shared)
CT Cable Connection Connector	Connector for connecting cables from CT for power measurement
IO and RS485 communication connector	It can be a Digital input or a Digital output. (Selectable depending on model) It is also used for RS485 communication.
DIN rail mounting lock	This is a fixing mechanism when mounted on a DIN rail

6. Dimensions

6-1. External Dimensions

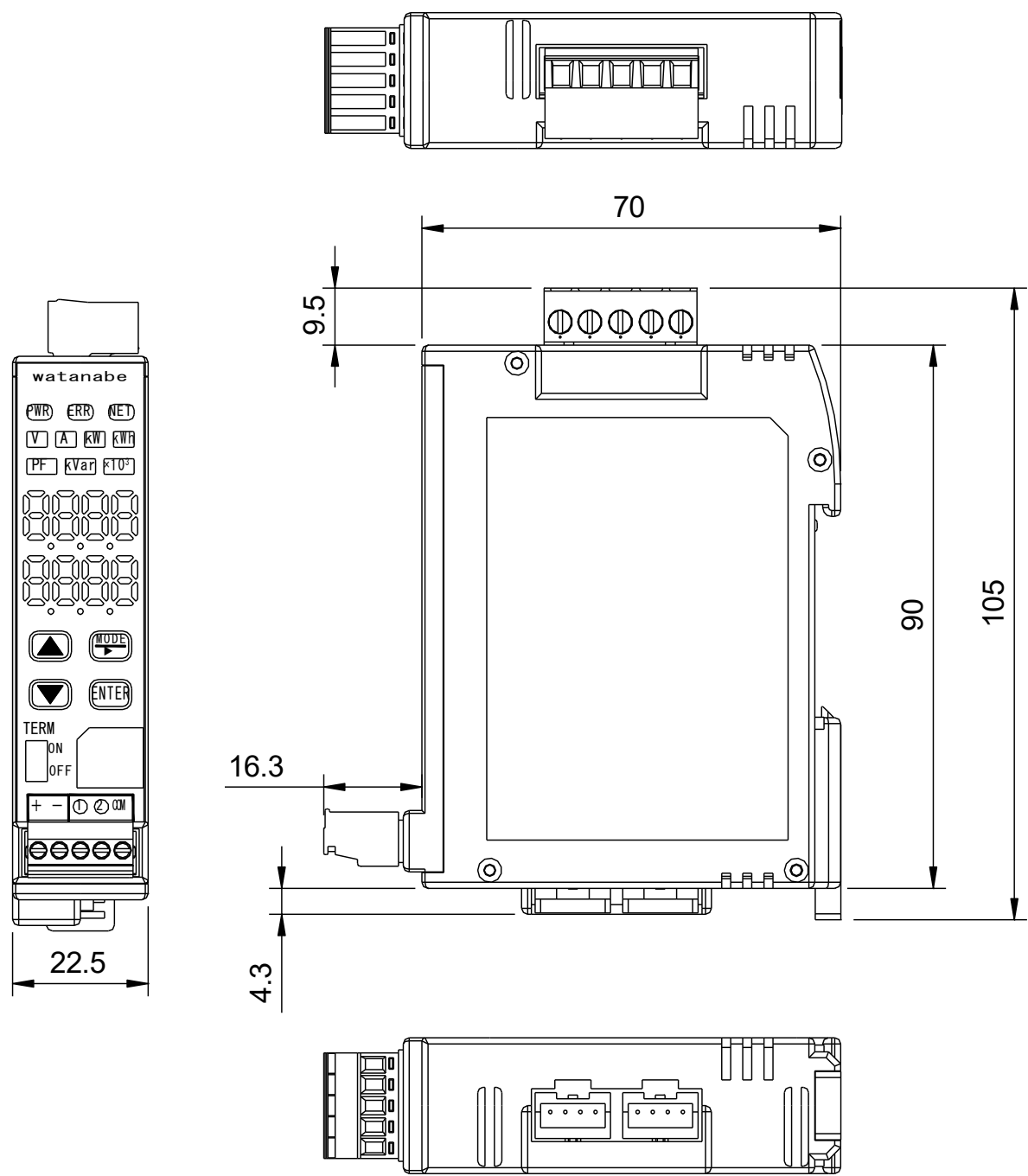


Diagram 6-1 Dimensions WMS-PE2D□

7. Terminal Arrangement

7-1. Terminal Array Diagram

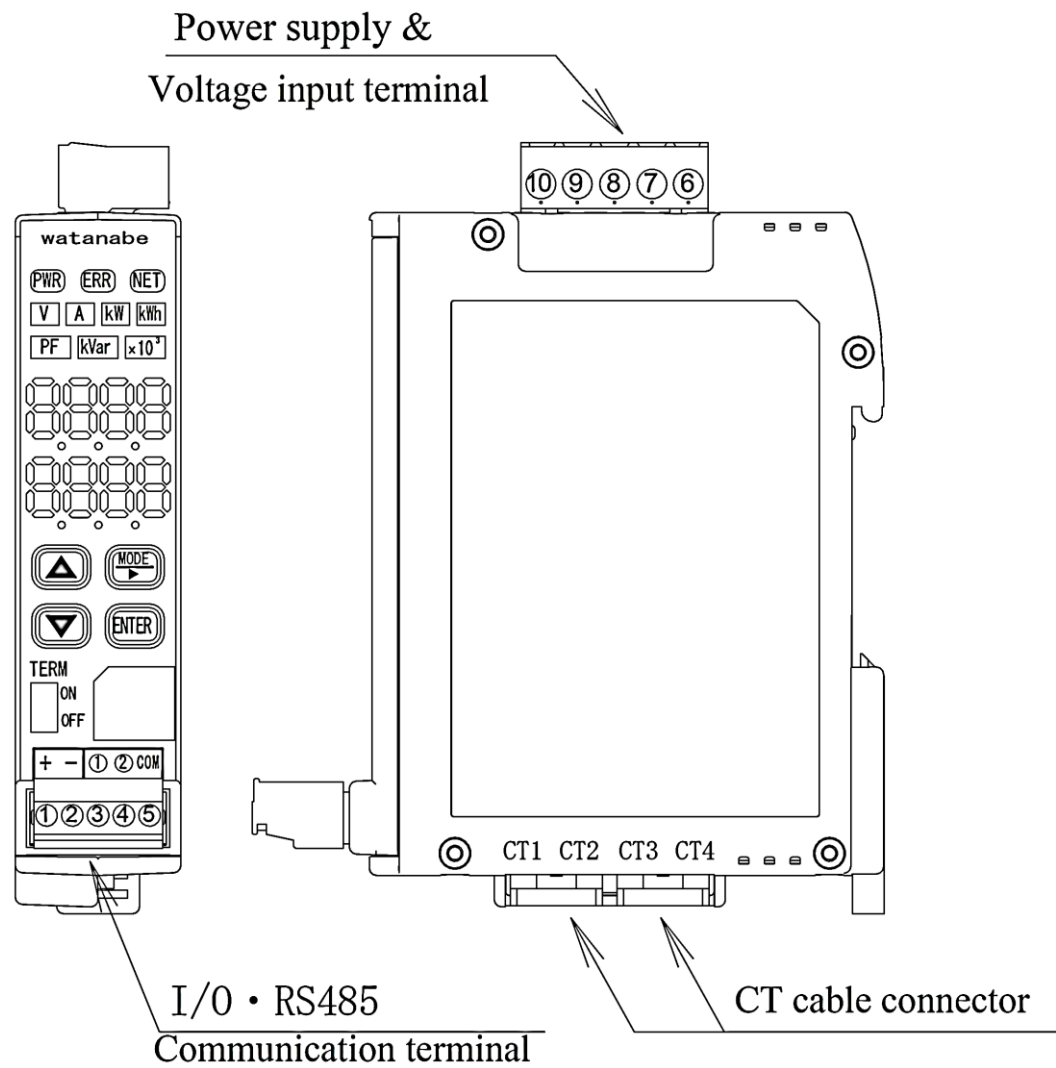


Diagram 7-1 Pin Layout Diagram WMS-PE2D□

■WMS-PE2DI (2ch Digital input model)

Terminal		Name	Description
Input & RS-485 communication terminal	1	RS485	+
	2		-
	3	INPUT	1
	4		2
	5		COM
CT connector	-	CT1 ~ CT4	Special CT connecting cable
Power supply & Volget input terminal	6	FG	Frame ground terminal
	7	VOLTAGE	P1
	8		P0
	9		P2
	10		P3

■WMS-PE2DO (2ch Digital output)

Terminal		Name	Description
Output & RS-485 communication terminal	1	RS485	+
	2		-
	3	OUTPUT	1
	4		2
	5		COM
CT connector	-	CT1 ~ CT4	Special CT connecting cable
Power supply & Input terminal	6	FG	Frame ground terminal
	7	VOLTAGE	P1
	8		P0
	9		P2
	10		P3

Electrical Systems	Terminals			
	P3	P2	PO	PI
1P2W			N	I
1P3W		2	N	I
3P3W		T	S	R
3P4W	T	S	N	R

8. Circuit Block Diagram

8-1. WMS-PE2DI Circuit Block Diagram

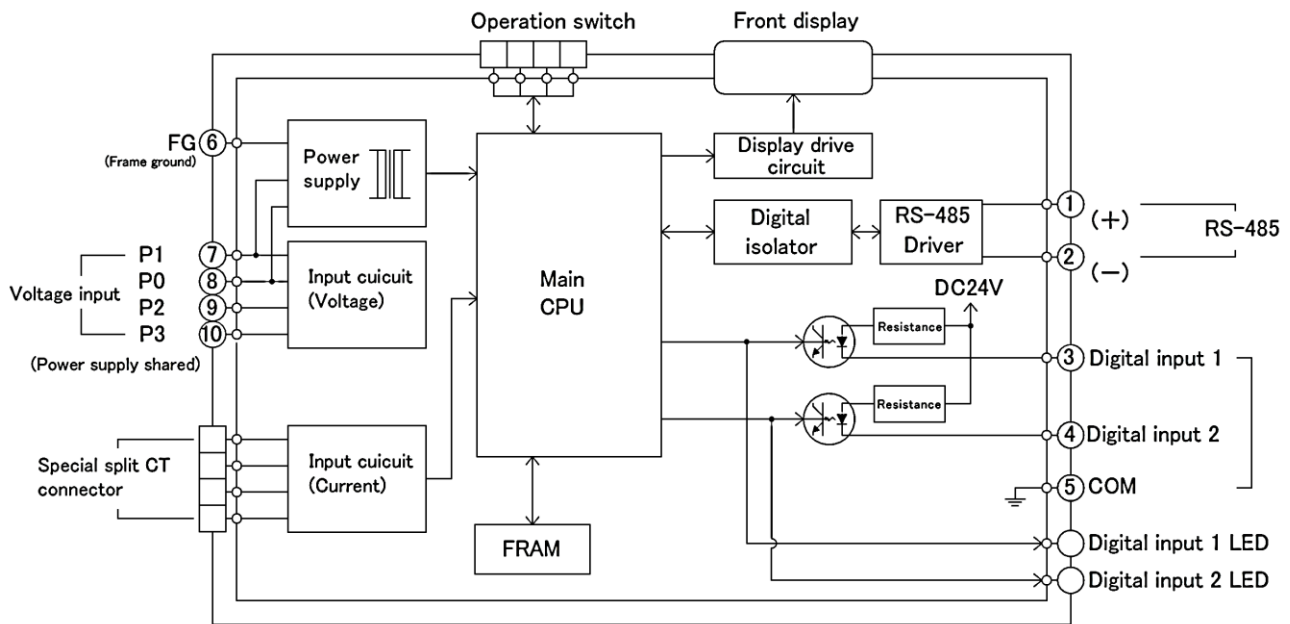


Diagram 8-1 Circuit Block Diagram WMS-PE2DI

8-2. WMS-PE2DO Circuit Block Diagram

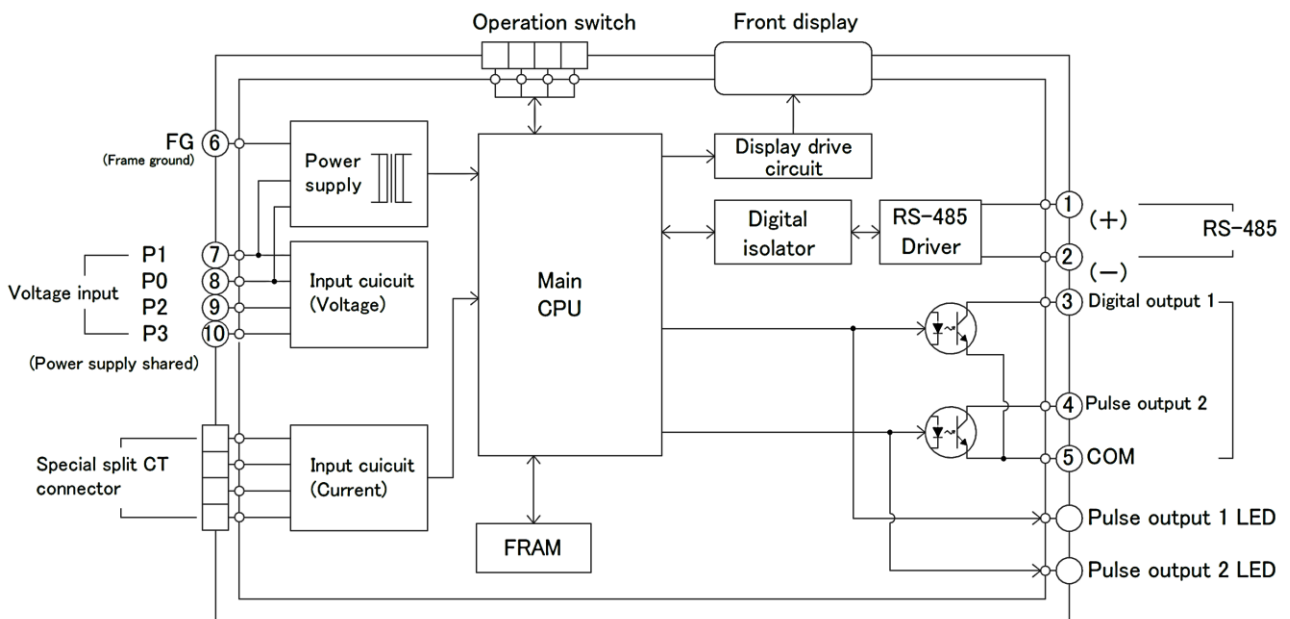


Diagram 8-2 Circuit Block Diagram WMS-PE2DO

9. Attaching and detaching the main unit

9-1. DIN rail mounting method

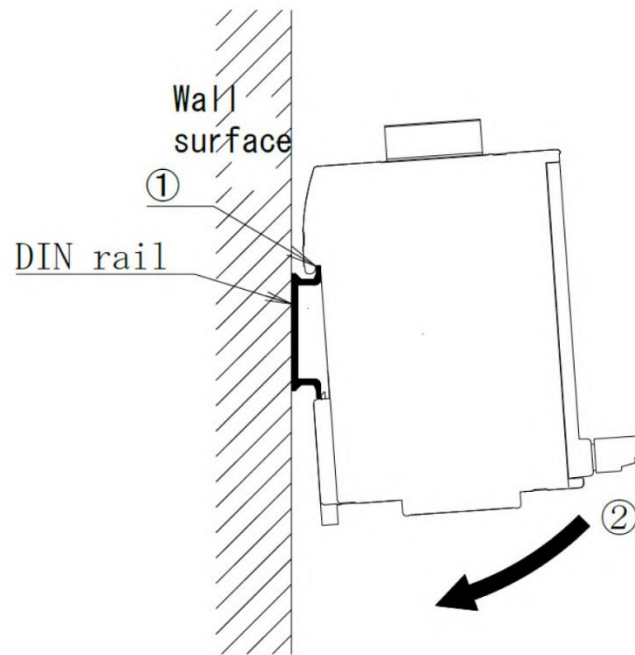


Diagram 9-1 DIN rail mounting method

1. Put the hook of the DIN rail mounting groove on the back of the main unit on the DIN rail.
2. Press the top of the main unit in the direction of the arrow in the figure until you hear a "click" sound.
3. Make sure that the main unit is firmly fixed to the DIN rail.

9-2. DIN rail removal method

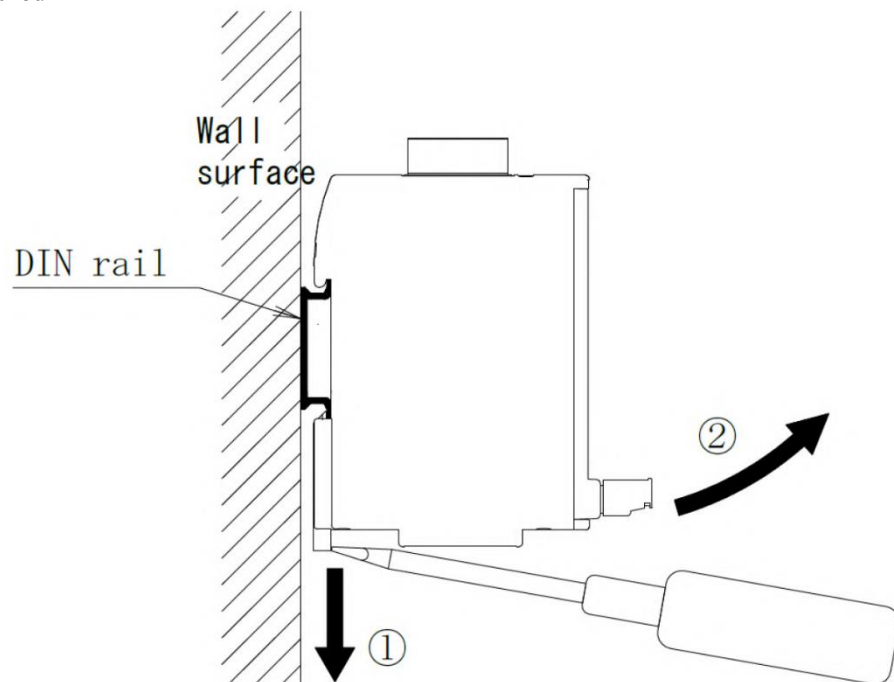


Diagram 9-2 DIN rail removal method

1. Insert a flat-blade screwdriver into the groove of the slider of the socket and remove it by pulling the lower part of the unit toward you (2) while pulling in the direction of the arrow (1) in the figure.

10. Wiring method (Power supply and voltage input)

10-1. Wiring of power supply and voltage input signals

The wiring of the FG, control power supply, and voltage input line of this instrument is wired to the terminal block at the bottom of the instrument.

Please see below for the procedure and precautions to be taken.

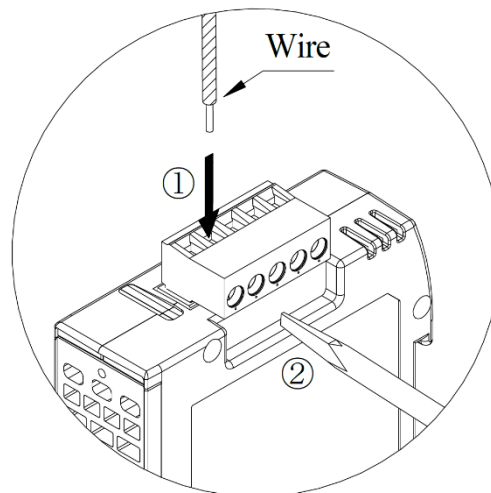
1) Wiring to power supply and voltage input terminals

- (1) Loosen the screws on the front terminal block of the instrument with a flathead screwdriver.
- (2) Insert the electric wire into the hole of the terminal block and tighten the screw to fix it.

Recommended lead wire size: 0.2–2.5 mm² (AWG28–12)

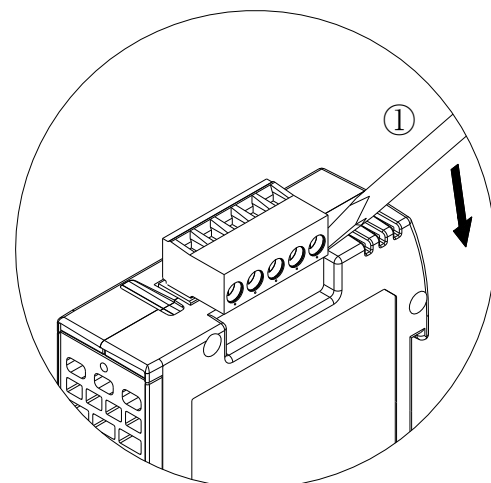
Stripping length: 7–8 mm

Screw tightening torque: 0.5N·m



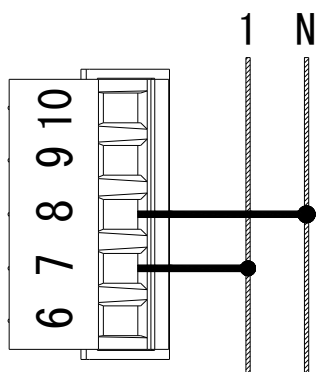
2) Removal of power supply and voltage input terminals

- (1) If the power supply and voltage input terminals are difficult to remove, insert a flat-blade screwdriver into the gaps on both sides of the terminals and press them down to the bottom. The terminals float up for easy removal.



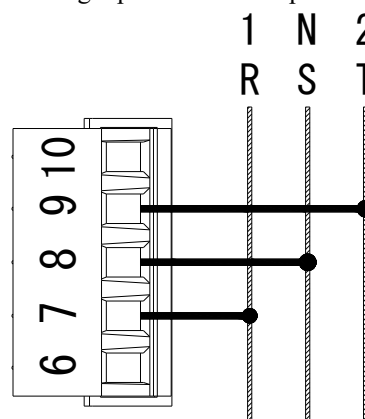
Depending on the Electrical systems, wire as shown in the figure below.

○ Single-phase 2 wires

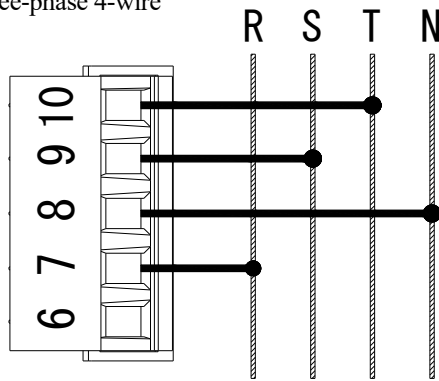


○ Single-phase 3 wires /

Single-phase 2 wires branched from single-phase 3 wires /
Single-phase 3-wire + single-phase 2-wire / 3-phase 3-wire



○ Three-phase 4-wire



Caution

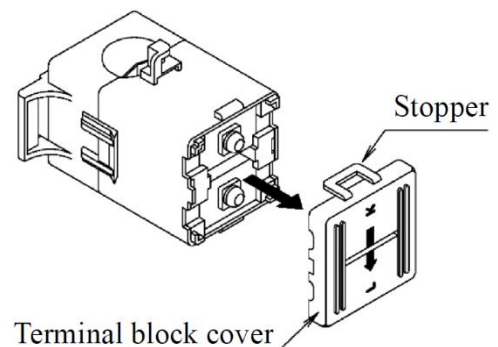
Only AC110/220 can be connected to the voltage input for power measurement of this instrument.
When measuring circuits with a voltage higher than (AC6600 V, etc.), use VT (PT) and wire from the secondary side of VT (PT) to this instrument.

10-2. Connecting the Current Signal (CT) for Power Measurement

10-2-1. WCTF Connections

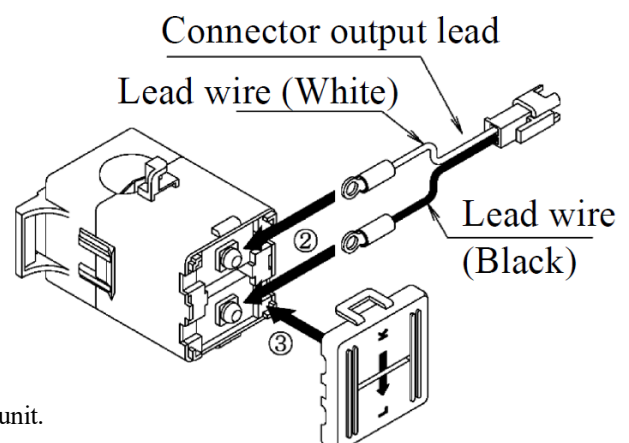
(1) Connecting WCTF

- (1) Unfold the stopper of the terminal block cover at the bottom of the CT and remove the terminal block cover from the CT body.



- (2) Screw the connector output lead supplied with the CT to the CT bottom terminal block. At that time, connect the lead wire (white) to K of the terminal block and the lead wire (black) to the L of the terminal block.

Tightening torque : 0.5–0.6 [N · m]



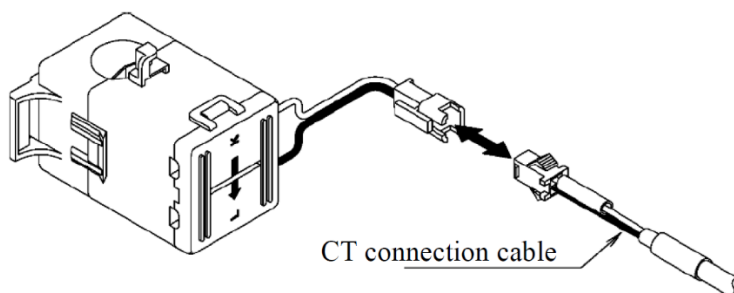
- (3) Attach the removed terminal block cover to the CT main unit.



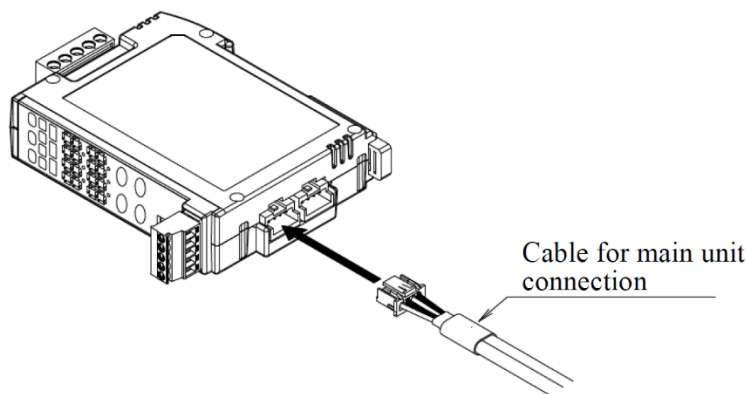
Caution

- Be sure to wire the lead for connector output correctly k and l to the CT terminal block. If the wrong wiring is performed, power measurement will not be performed properly.
- Be sure to attach the terminal block cover to the CT before use. If the cover is not covered, it may cause a short circuit accident or electric shock.

- (4) Connect the connector of the connector output lead attached to the CT to the connector of the CT connection cable (CTL-BUN-2P).



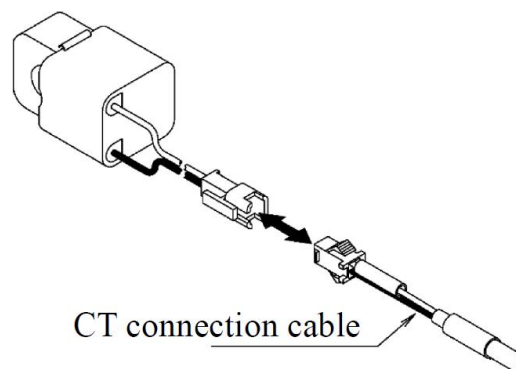
- (5) Connect the other connector of the CT connection cable (CTL-BUN-2P) to the CT cable connection connector on the underside of the unit.



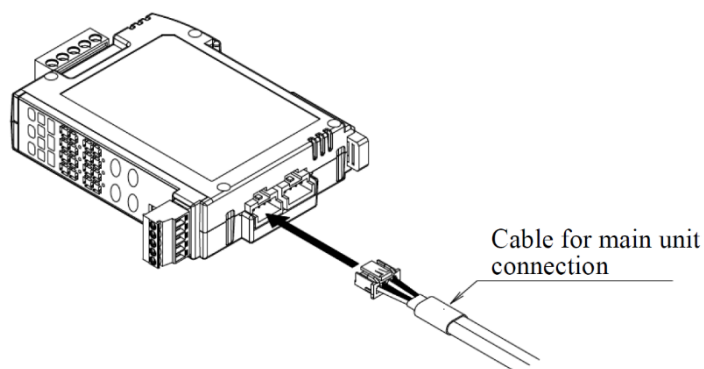
* The cable length of the CT connection cable (CTL-BUN-2P) is 2 m. If the cable length is insufficient, use a CT extension cable (CTL-EN-03, cable length 3 m) to extend it. (3 longest 11m)

10-2-2. Connecting the CTL-10-CLS9

- (1) Connect the connector of the lead wire extending from the CT to the connector of the CT connection cable (CTL-BUN-2P).



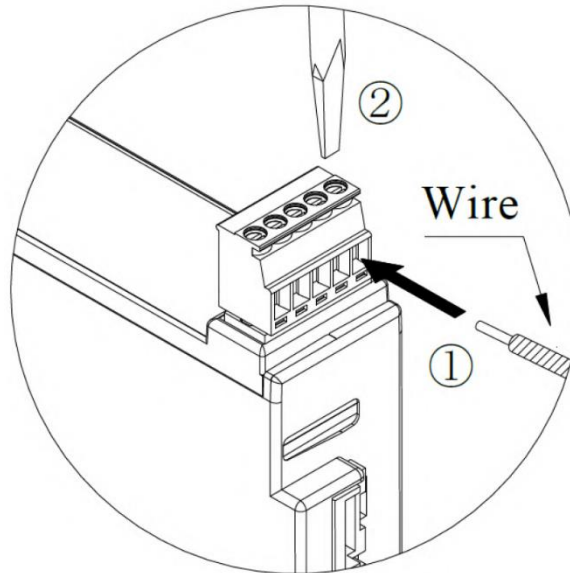
- (2) Connect the other connector of the CT connection cable (CTL-BUN-2P) to the CT cable connection connector on the underside of the unit.



* The cable length of the CT connection cable (CTL-BUN-2P) is 2 m. If the cable length is insufficient, use a CT extension cable (CTL-EN-03, cable length 3 m) to extend it. (3 longest 11m)

11. Wiring method (Digital input, Digital output)

- (1) Loosen the screws on the front terminal block of the instrument with a flathead screwdriver.
(The terminal block is removable.)
- (2) Insert the electric wire into the hole of the terminal block and tighten the screw to fix it.



Recommended lead wire size : Wire diameter 0.2–1.5 mm² (AWG28–14)
 Stripping length : 6–7mm
 Screw tightening torque : 0.2N•m

* When using stranded wire for wiring, it is recommended to use a rod terminal with an insulated cover (DN46228-4 compliant product).

Recommended bar terminals: AI0.34-8TQ (for AWG22)

AI0.5-8WH (for AWG20)

Crimping Tool : CRIMPFOX6

(All made by Phoenix Contact Co., Ltd.)

* When removing the wire, remove the wire with the screw loosened in the same way.

Caution

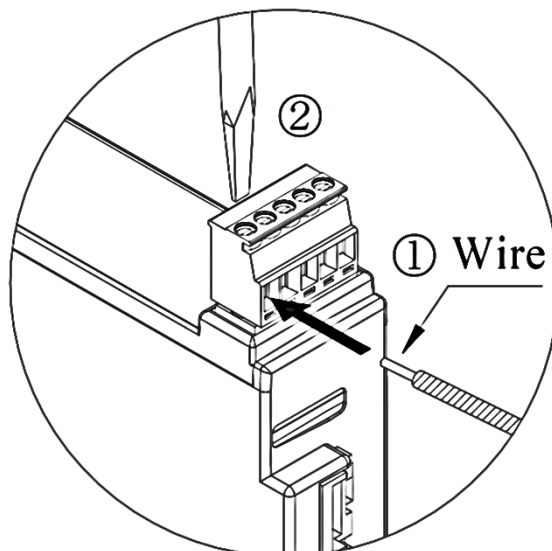
When using rod terminals for wiring to Digital output connectors, pay attention to the contact between the rod terminals.

If the rod terminal conduction comes into contact with the conductive part of another rod terminal, the measurement cannot be performed normally.

12. Wiring method (RS485 communication line)

12-1. RS485 communication line connection

- (1) Loosen the screws on the front terminal block of the instrument with a flathead screwdriver.
(The terminal block is removable.)
- (2) Insert the electric wire into the hole of the terminal block and tighten the screw to fix it.



Recommended lead wire size : Wire diameter 0.2–1.5 mm² (AWG28–14)

Stripping length : 6–7 mm

Screw tightening torque: 0.2N·m

12-2. About RS485 communication line

For the communication line, use a twisted-pair cable that meets the following specifications.

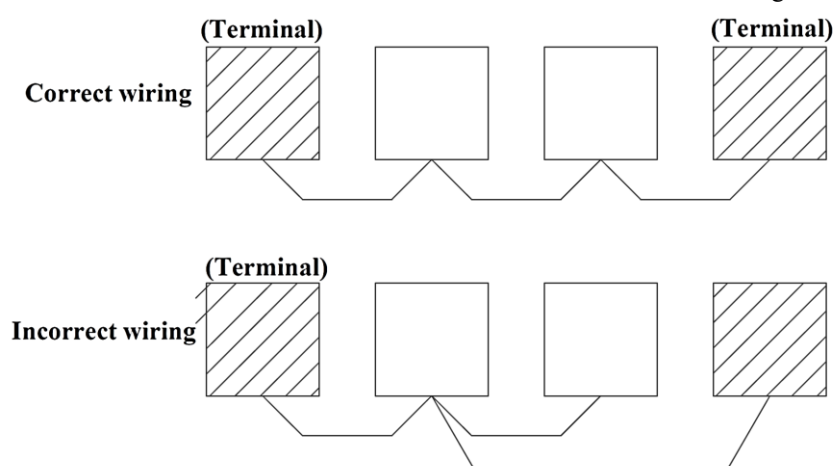
Recommended communication lines

Cable	Size	Equivalent	
Shielded twisted-pair cable	AWG14–AWG28	Hitachi Metals	CO-SPEV-SB(A) 1Px0.3SQ LF, etc. (AWG22 equivalent)

12-3. Wiring between devices

Wire the communication lines to connect to the Master device and other Slave devices.

The RS485 communication line between the devices should be wired as shown in the figure below.

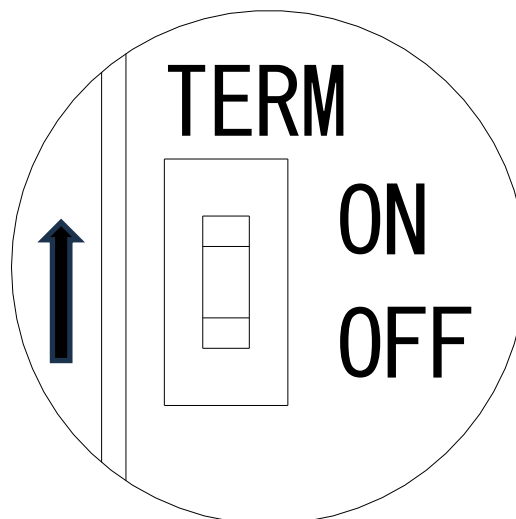


Caution

- Please wire according to the following contents. If the wiring is not correct, it may cause a communication error.
- The total length of the communication line should not exceed 1200 M.
Please note that the total length distance may vary depending on the model to be connected.
- Use only one type of communication line. Do not mix two or more types of communication lines.
- In places with poor noise environments, use a shielded twisted pair cable.
- When using a shielded cable for the RS485 transmission line, use one-sided grounding (type D grounding).
- Do not share the grounding with other grounding wires.
- If you make a mistake in the polarity of the communication line, you will not be able to communicate, so please wire according to the polarity between the devices.
- In the RS485 transmission line, please wire across each module. Branch wiring is not allowed.

12-4. About Termination Resistors

When the termination resistor SW on the front of the instrument is turned on, the termination resistor (120 Ω) is enabled.

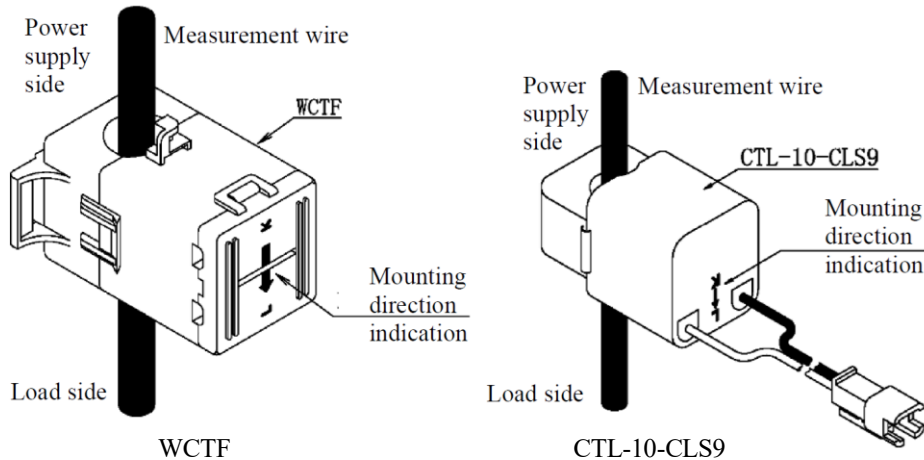


13. Attaching CT to power measurement points

13-1-1. Installing WCTF/CTL-10-CLS9

When attaching a CT for power measurement, pay attention to the mounting direction display on the CT body.

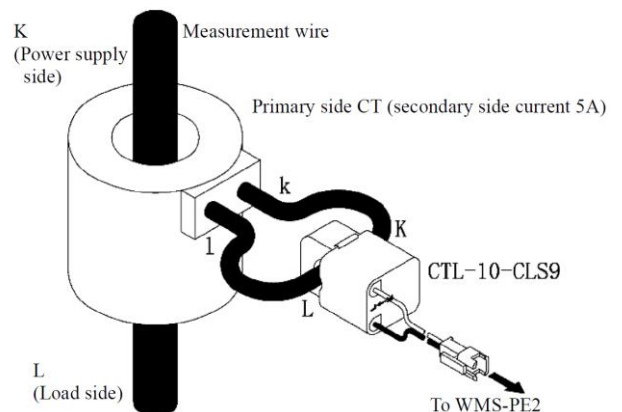
(K: Power supply side, L: Load side)



13-1-2. Measurement of circuits with current values greater than 600 A

When measuring a circuit with a current value of more than 600 A, install a CT by the following method.

- (1) Install a CT (primary CT) of 5A on the secondary side of the measuring wire.
- (2) Short-circuit the secondary output terminals (k, l) of the primary CT.
- (3) Install the CTL-10-CLS9 on the wire with the secondary output terminal shorted. At this time, pay attention to the mounting direction (K, L) of the CTL-10-CLS9 with respect to the current direction (k→l) of the wire with which the secondary output terminal is shorted.



⚠ Caution

- When installing the CT, install it in the correct mounting direction (K: power supply side, L: load side). If the installation direction is wrong, the power measurement will not be performed correctly.
- If foreign matter such as dust adheres to the core cross-section of the CT, the performance will deteriorate, so be careful not to adhere to the core cross-section when attaching the CT. In addition, do not touch the core cross-section, as it may cause debris to adhere.
- The CT for 600 A measurement (WCTF-600 A-K) is sandwiched with rust prevention paper at the time of shipment, so please remove this paper before use. In addition, it may cause rust or foreign matter adhesion, so never touch the core cross-section.
- The dedicated split CT (WCTF/CTL-10-CLS9) cannot be used in high-voltage circuits exceeding 600 VAC. When measuring high-voltage circuits, use a combination of a high-voltage CT and the CTL-10-CLS9.
- WCTF can only be used in circuits of 300 V AC or less in the case of bare wires. Do not use in circuits above 300 VAC.

14. Example of power measurement wiring

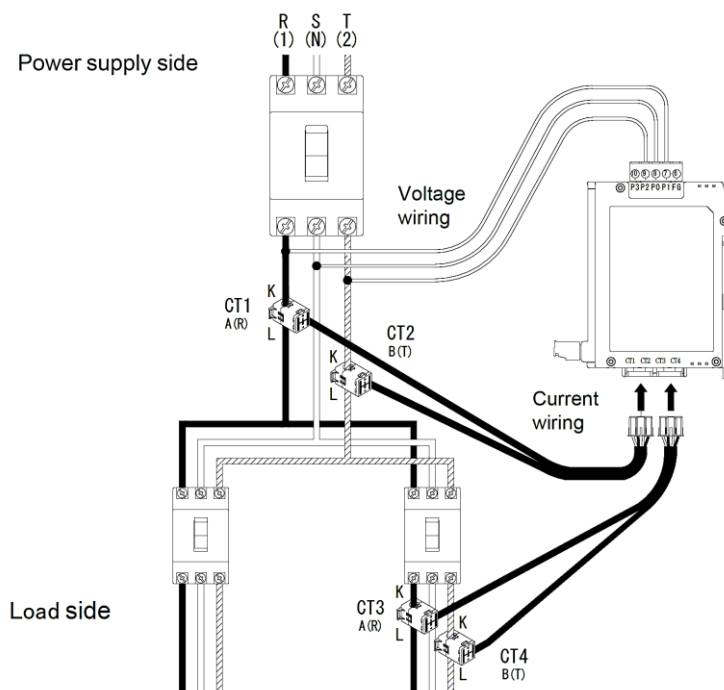
Please note that power cannot be measured correctly unless the wiring is as follows.

- Wire the voltage phase as shown in the wiring example.
- Check the symbol on the CT connection cable and clamp the CT to the phase as shown in the wiring example.
- Clamp the K and L directions of the CT so that they are the same as the power supply side / load side of the wiring example.

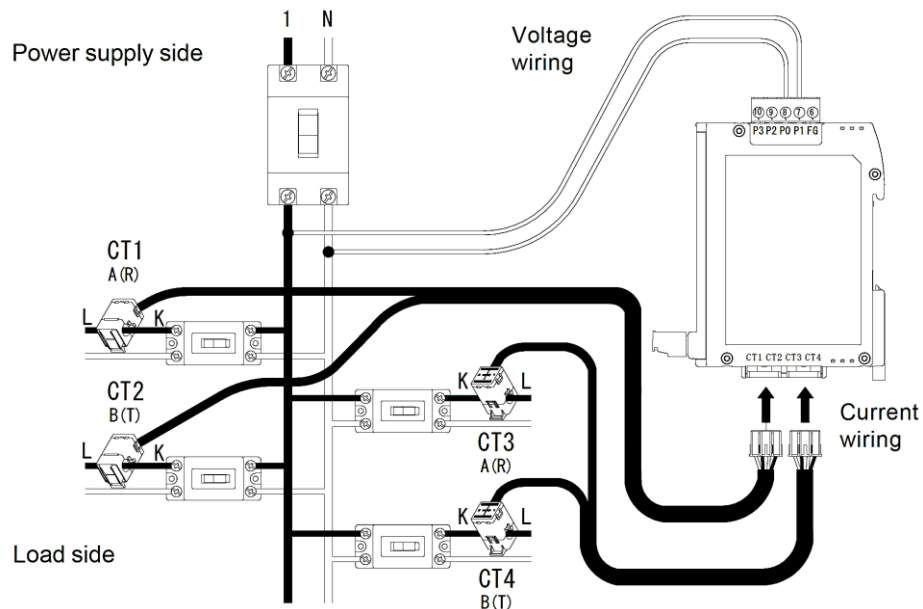
⚠ Caution

- Connect the voltage wiring (R-S-T, 1-N-2) in the correct order. If you make a mistake in the order, you will not be able to perform the power measurement correctly.
- When installing the CT, install it in the correct mounting direction (K: power supply side, L: load side) and mounting position (R phase, T phase, 1 phase or 2 phase). If the mounting direction or mounting position is wrong, power measurement cannot be performed correctly.

- Single-phase 3-wire / Three-phase 3-wire wiring example

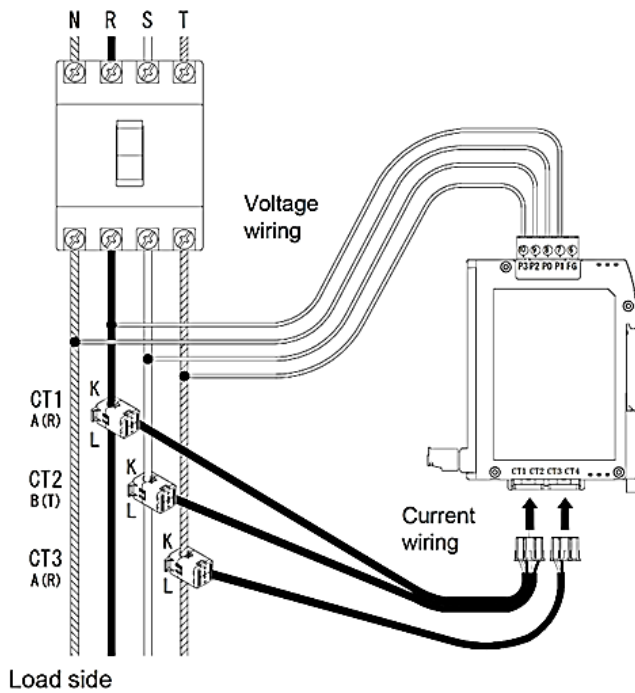


- Single-phase 2-wire wiring example



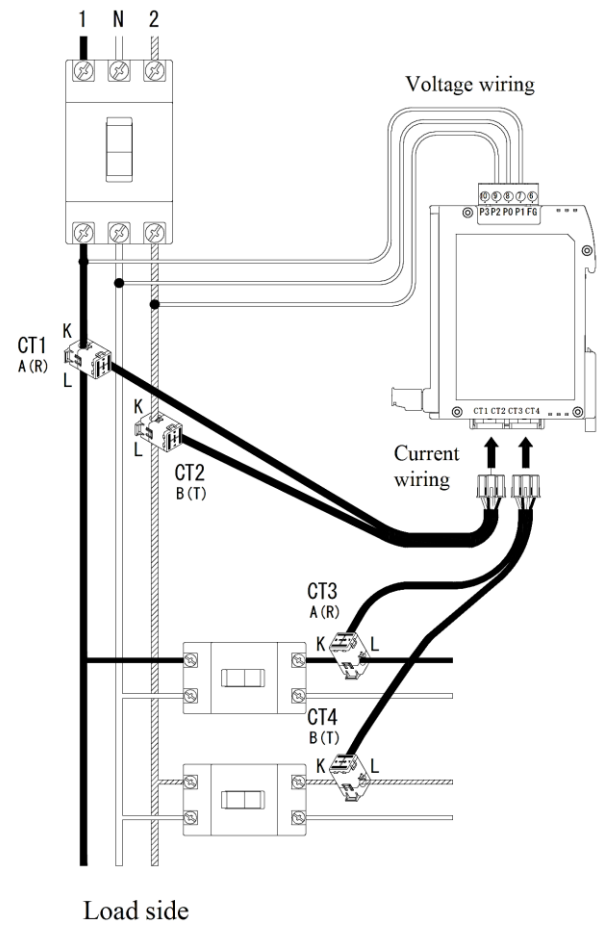
• Three-phase 4-wire wiring example

Power supply side



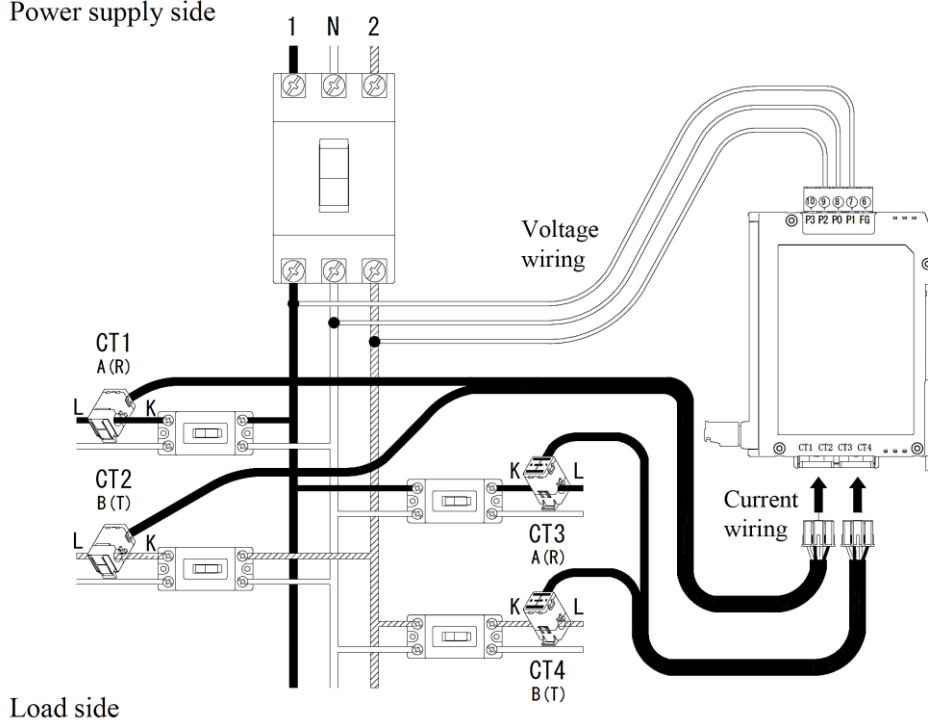
• Single-phase 3-wire + single-phase 2-wire wiring example

Power supply side



• Single-phase 2 wire branched from single-phase 3-wire Wiring example:

Power supply side



15. Measurement Modes

In measurement mode, you can check Voltage, Current, Active power, Reactive power, Power factor, Active energy, and Conversion value.

When the power is turned on, it starts in this measurement mode.

Section 15-1 describes the list of LED lights in measurement mode and how to operate them.

From Section 15-2 onwards, the details of the display contents are explained for each measurement data.

15-1. Switching the display

Section 15-1-1. provides an overview of the list of operations during measurement mode.

Sections 15-1-2–4 show the display contents of 7-segment LEDs, unit LEDs, and DI/DO LEDs.

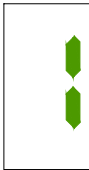
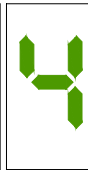
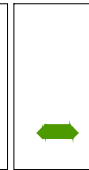
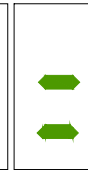
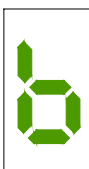
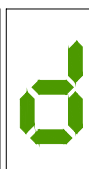
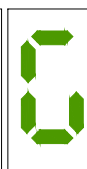
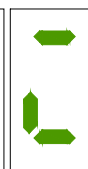
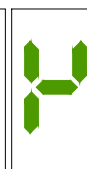
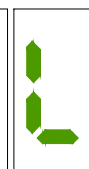
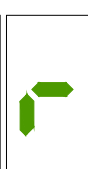
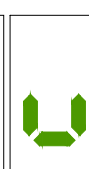
From Section 15-2 onwards, we will explain the details of the operation method, such as switching display items.

15-1-1. List of switch operations during measurement mode

○: Short press, ⊙: Long press

Operations in Measurement mode				
				Operation details
○	○			Switching the type of measurement data displayed, Switching the display phase of current/voltage, Switching the digits displayed for energy measurements
⊙				Toggle lock/unlock for key operation
		○		Switching the circuit to be measured
			○	Returning from the measurement data display screen to the measurement data type screen
			⊙	Transition to setting mode

15-1-2. List of 7-segment display characters

												
0	1	2	3	4	5	6	7	8	9	—	_	=
												
A	B	C	D	E	F	G	H	I	J	K	L	M
												
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

15-1-3. Unit LED Display List

Depending on the measurement status, the unit LED lights up or flashes as follows.

Unit LED	Display States	meaning
	Lighting	Indicates that the power is on and energized.
	Lighting	Indicates that an abnormality such as a malfunction has occurred.
	Flashing	Indicates that Modbus communication is in progress.
	Lighting	Indicates that the voltage value is being displayed.
	Flashing	Indicates that the voltage value is out of the measurement range.
	Lighting	Indicates that the current value is being displayed.
	Flashing	Indicates that the current value is out of the measurement range.
	Lighting	Indicates that Active power is being displayed.
	Flashing	Indicates that the Active power is out of the measured range.
	Lighting	Indicates that the amount of Active power is being displayed.
	Lighting	Indicates that the Power factor is being displayed.
	Lighting	Indicates that Reactive power is being displayed.
	Flashing	Indicates that the Reactive power is out of the measured range.
	Lighting	Indicates that the displayed value is multiplied by 1,000. For example, if this LED and "V" are both lit, the unit is 1,000 volts, or kV.

15-1-4. DI/DO LED Display List

Depending on the ON state of DI/DO, the DI/DO LED will light up as shown below.

If it is OFF, the light will be off.

DI/DO LED	Display States	Meaning
	Lighting	DI (Digital input) 1ch is ON. Alternatively, it indicates that DO (Digital output) 1ch is ON.
	Lighting	DI (Digital input) 2ch is ON, Alternatively, it indicates that DO (Digital output) 2ch is ON.

15-2. Switching Circuits

The number of measurable circuits varies by phase configuration. Refer to the table below for details.

Circuit A is always used regardless of the phase configuration. Please configure the necessary settings in the following items as needed:

[2-2. Rated Current Input to 2-12. Quick Wiring Error Diagnosis].

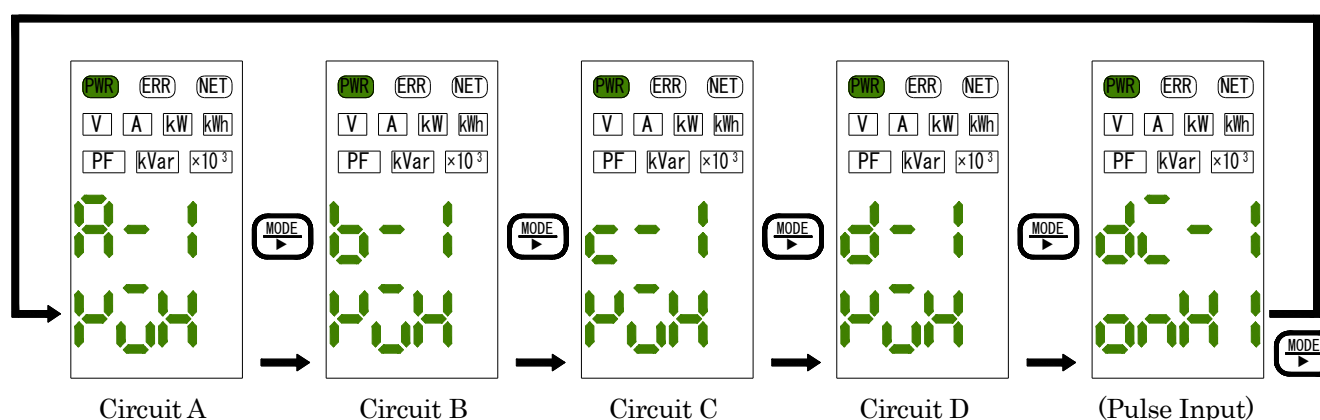
Circuits B to D can be used to increase the number of measurement points.

To do this, enable the following settings according to the circuit:

[3-1 (Circuit B), 4-1 (Circuit C), 5-1 (Circuit D) – Circuit Enable/Disable Setting]. * **These settings are disabled by default.**

Each short press of the "MODE/▷" switch cycles through Circuit A → B → C → D.

*For WMS-PE2DI (Digital input model), "DI" is added: Circuit A → B → C → D → DI.



Circuits that cannot be displayed for measurement are skipped and displayed even if "MODE/▷" is pressed briefly.

○ Measurable circuit by Electrical systems

Electrical systems	Max. circuit	Circuit A	Circuit B	Circuit C	Circuit D
Single-phase 2-wire	4 circuits	○	○	○	○
Single-phase 3-wire	2 circuits	○		○	
Three-phase 3-wire	2 circuits	○		○	
Three-phase 4-wire	1 circuit	○			
Single-phase 2-wire branched from Single-phase 3-wire	4 circuits	○	○	○	○
Single-phase 3-wire +	1P3W : 1 circuit	○			
Single-phase 2-wire	1P2W : 2 circuits			○	○

* In single-phase 3-wire and 3-phase 3-wire, circuits B and D are not used. In three-phase 4-wire, circuit B – circuit D is not used.

○ Measurable circuit by Electrical systems and CT assignment

Electrical systems	Common Circuit	Circuit A	Circuit B	Circuit C	Circuit D
Single-phase 2-wire (4 circuits)	Single-phase 2-wire	Single-phase 2-wire CT1	Single-phase 2-wire CT2	Single-phase 2-wire CT3	Single-phase 2-wire CT4
Single-phase 3-wire (2 circuits)	Single-phase 3-wire	Single-phase 3-wire CT1 / CT2	—	Single-phase 3-wire CT3 / CT4	—
Three-phase 3-wire (2 circuits)	Three-phase 3-wire	Three-phase 3-wire CT1 / CT2	—	Three-phase 3-wire CT3 / CT4	—
Three-phase 4-wire (1 circuit)	Three-phase 4-wire	Three-phase 4-wire CT1 / CT2 / CT3	—	—	—
Single-phase 2-wire branched from Single-phase 3-wire (4 circuits)	Single-phase 2-wire	Single-phase 2-wire CT1	Single-phase 2-wire CT2	Single-phase 2-wire CT3	Single-phase 2-wire CT4
Split from 3-phase 3-wire Single-phase 2-wire (2 circuits)	Single-phase 3-wire	Single-phase 3-wire CT1 / CT2	—	Single-phase 2-wire CT3	Single-phase 2-wire CT4

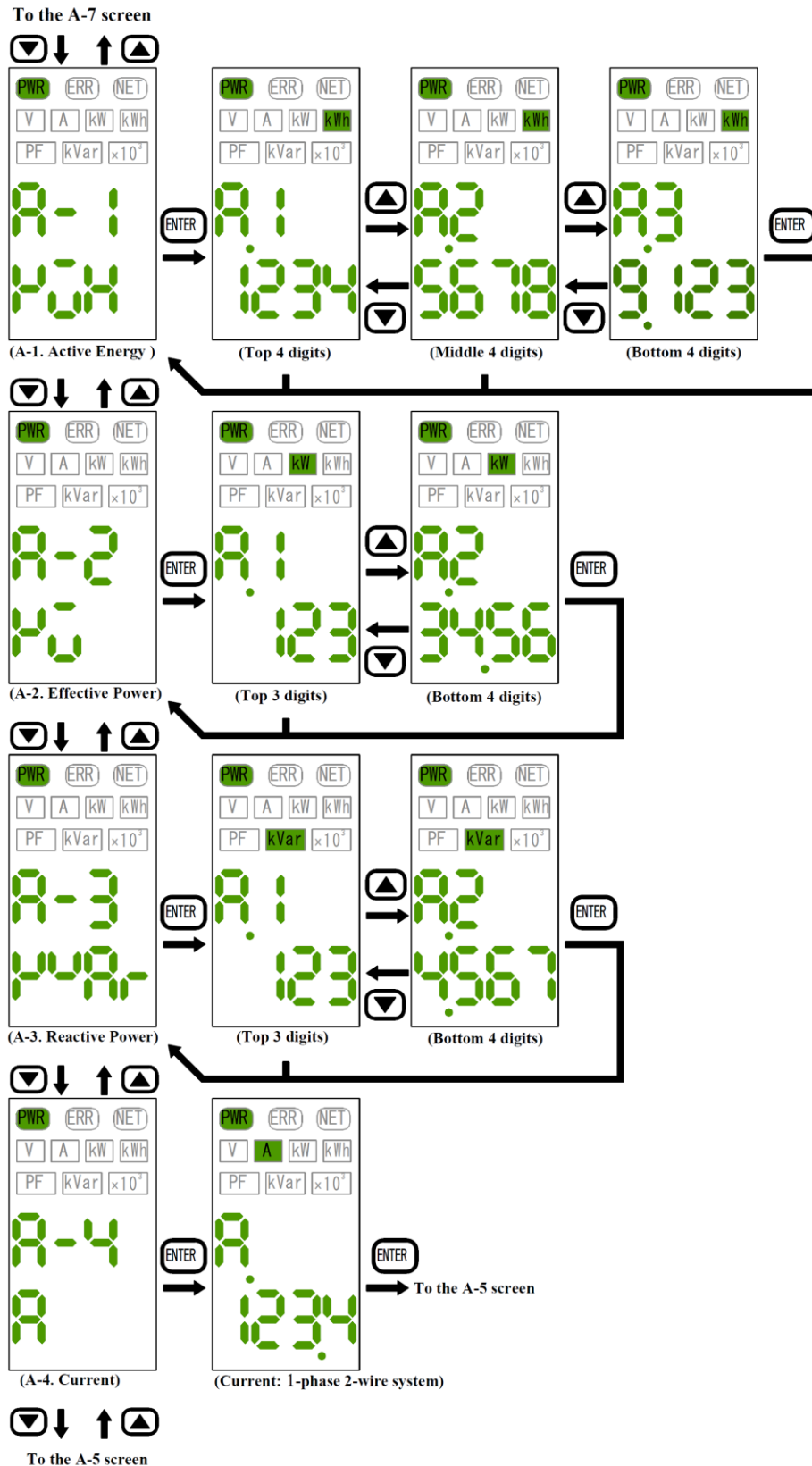
15-3. Switching Measurement Elements

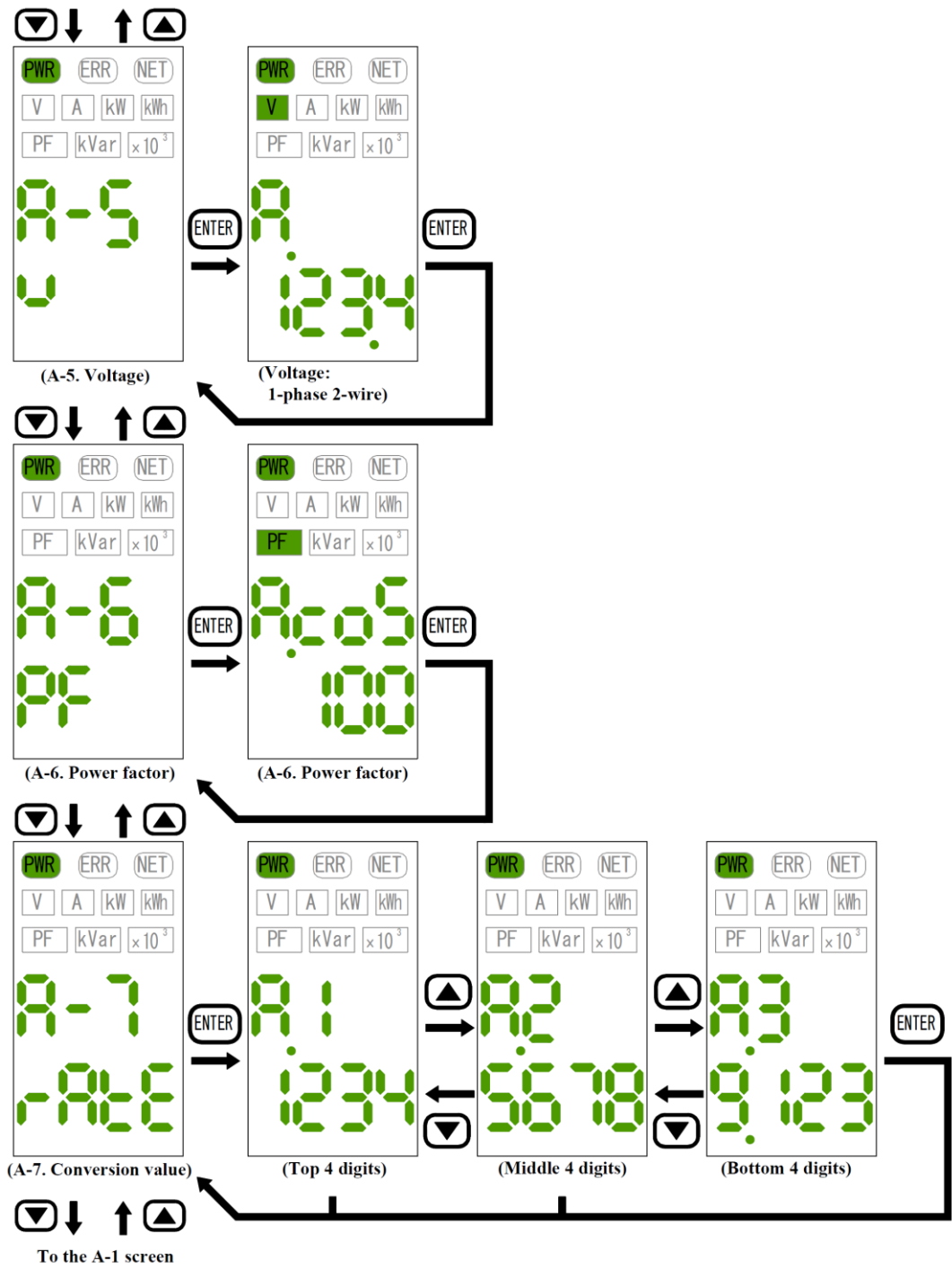
A short press of the "ENTER" switch toggles between the measurement item selection display and the individual measurement data displays.

A long press of the "ENTER" switch switches the unit from measurement mode to setting mode.

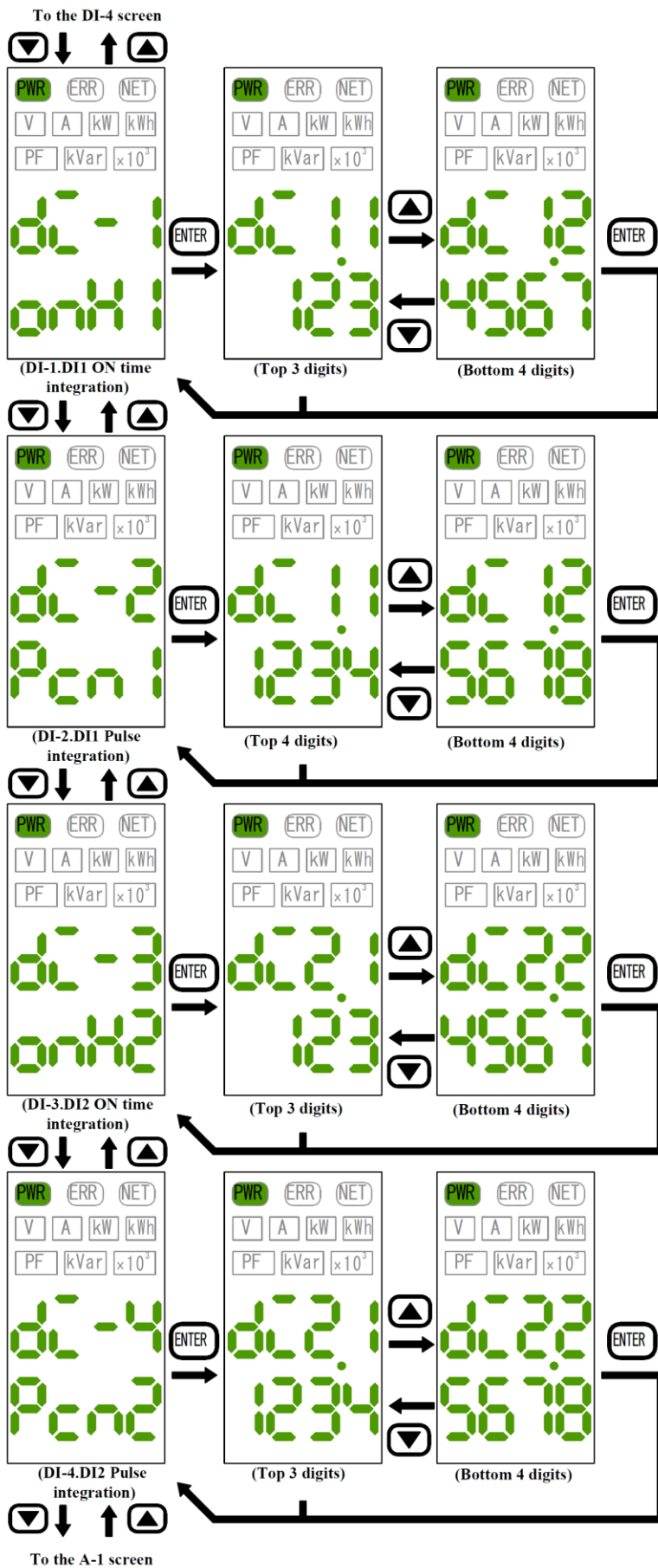
On the measurement item selection display, a short press of the "▼" switch moves to the next measurement item, while a short press of the "▲" switch returns to the previous item.

*For Active Energy, Active Power, Reactive Power, and Converted Values, only the lower digits are displayed if there are no higher digits.





○ In the case of WMS-PE2DI (Digital input specification), the following measurement elements are added.



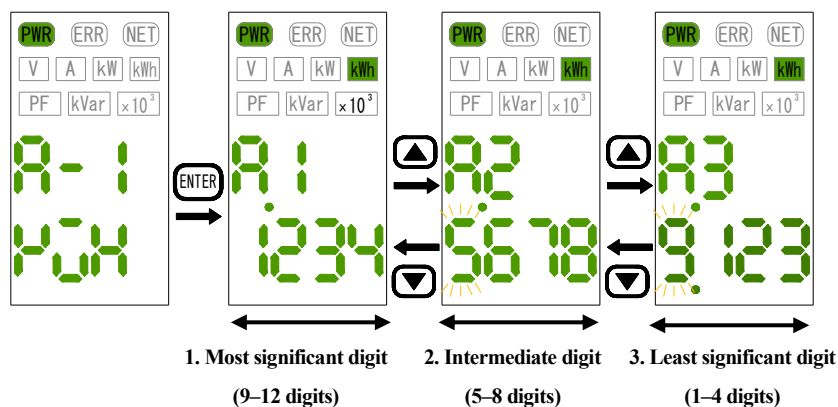
15-4. Active power display [kWh]

If there is a value in the digit above the most significant digit in the display, the most significant digit flashes.

Regardless of the rating, the decimal position is fixed,

and the upper 4 digits + middle 4 digits + lower 4 digits = a total of 12 digits are displayed.

The number of digits displayed at one time is 4 digits, and the upper and lower switches are switched between upper, middle, and lower displays by briefly pressing the up and down switches "▲" and "▼".



* If the amount of power exceeds 999,999,999.999 kWh, it will overflow and return to 0 kWh.

⚠ Caution

Even if the amount of power returns to 0 kWh due to overflow or power reset operation while the most significant or intermediate digits are displayed, the display digits will remain the same as the displayed digits. To change the display digits, operate the up and down switches "▲" and "▼".

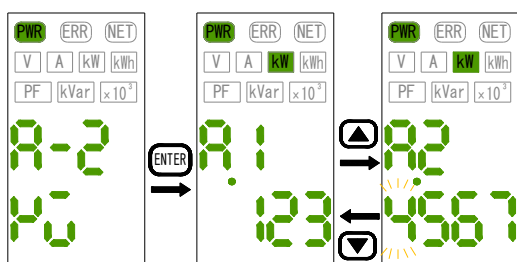
15-5. Active power / Reactive power indication [kW] [kVar]

The display digits and decimal positions of Active and Reactive power are calculated based on the set values of the Electrical systems, external CT rating, and External VT rating. The display digits and decimal points are fixed for each rated power and are as shown in the table below.

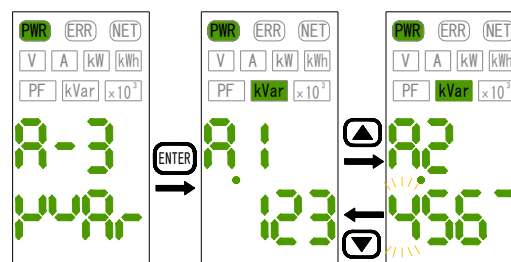
The Active power sign is displayed as a positive value for power reception and a negative value for power transmission.

The sign of the Reactive power is displayed as a positive value for lag and a negative value for forward.

(Active power)



(Reactive power)



Decimal position and display example of Active and Reactive power

Rated Power	Display Format	Unit LED
Less than 6kW	±X.XXX	[kW] / [kVar]
6kW to less than 60kW	±XX.XXX	[kW] / [kVar]
60kW to less than 600kW	±XXX.XXX	[kW] / [kVar]
600kW to less than 6 MW	±XXXX.XXX	[kW] / [kVar]
6 MW to less than 60 MW	±XXXXX.XXX	[kW] / [kVar]
60 MW to less than 600 MW	±XXXXXX.X	[kW] / [kVar]
600 MW and above	±XXXXXXX	[kW] / [kVar]

The rated power is calculated by the following formula according to the Electrical systems.

- Single-phase 2-wire: Rated power = (External CT rating) × (External VT rating)
- Single-phase 3-wire: Rated power = (External CT rating) × (External VT rating) × 2
- Three-phase 3-wire: Rated power = (External CT rating) × (External VT rating) × √3
- Three-phase 4-wire: Rated power = (External CT rating) × (External VT rating) × √3

15-6. Current display [A]

The display digits and decimal position of the current are fixed according to the set value of the external CT rating, and are shown in the table below.

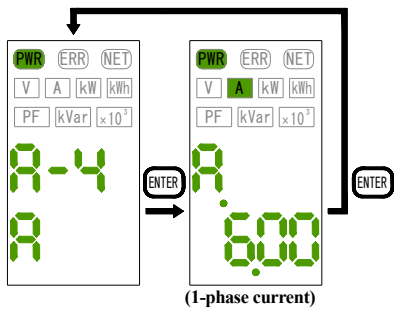
Decimal position of current and display example

External CT Rating	Display Format	Unit LED
5 to 8A or less	±X.XX	[A]
9 to 80 A or less	±XX.XX	[A]
81 to 800 A or less	±XXX.X	[A]
801 to 8000 A or less	±XXXX	[A]
8001 to 9999 A or less	±XX.XX	[×10 ³] [A]

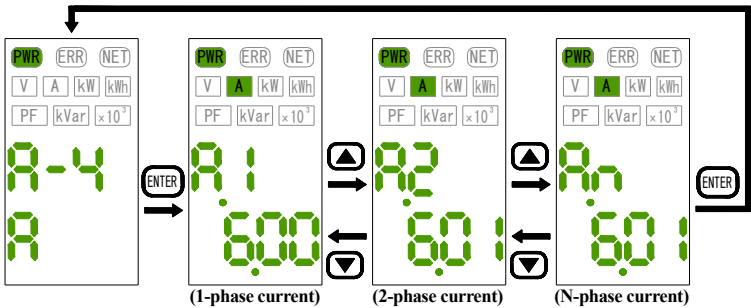
By briefly pressing the up and down switches "▲" and "▼" while the current value is displayed, the phase display is switched as shown in the figure below.

The switched phase display continues to be displayed even when the power is turned on and off.

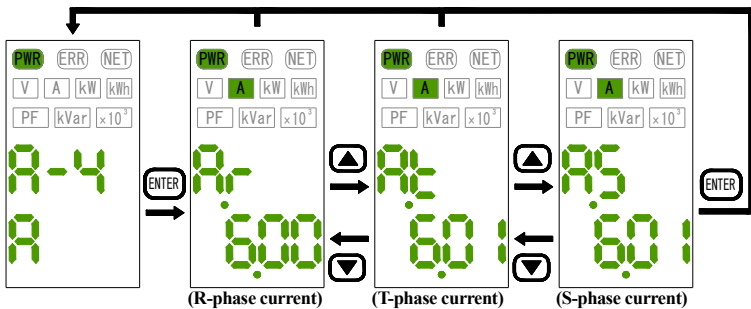
○ Phase display switching when single-phase 2-wire



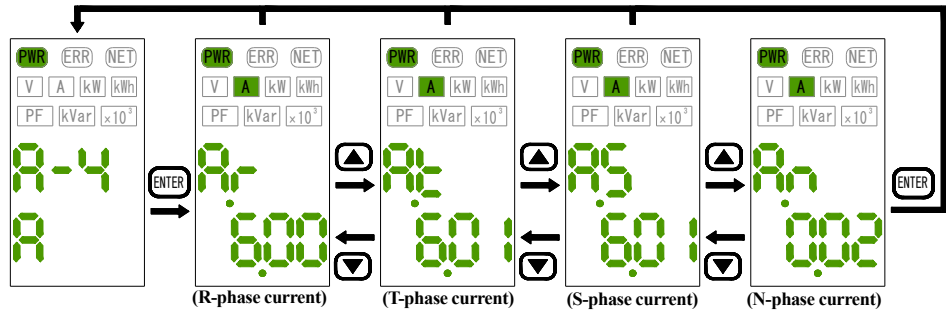
○ Phase display switching when single-phase 3-wire



○ Phase display switching when 3 phases and 3 wires



○ Phase display switching at the time of 3-phase 4-wire



15-7. Voltage display [V]

The voltage display digits and decimal point positions are fixed according to the set value of the External VT rating, and are as shown in the table below.

Decimal position and display of voltage

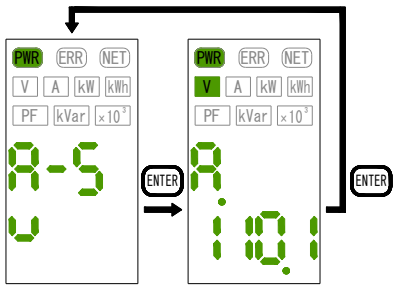
External VT rating	Display Format	Unit LED
110 to 800V or less	XXX.X	[V]
For 1-phase 3-wire 1-2 line voltage	XXXX	[V]
801 to 4000V or less	XXXX	[V]
For 1-phase 3-wire 1-2 line voltage	XX.XX	[$\times 10^3$] [V]
8001 to 77000V or less	XX.XX	[$\times 10^3$] [V]
For 1-phase 3-wire 1-2 line voltage	XXX.X	[$\times 10^3$] [V]

By briefly pressing the up and down switches "▲" and "▼" while the voltage value is displayed, the phase display is switched as shown in the figure below.

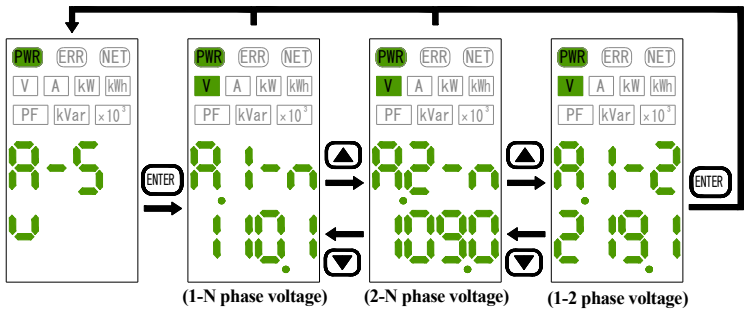
The switched phase display continues to be displayed even when the power is turned on and off.

* When Voltage-less measurement is set to ON, the external VT rated voltage is displayed fixed regardless of the current input.

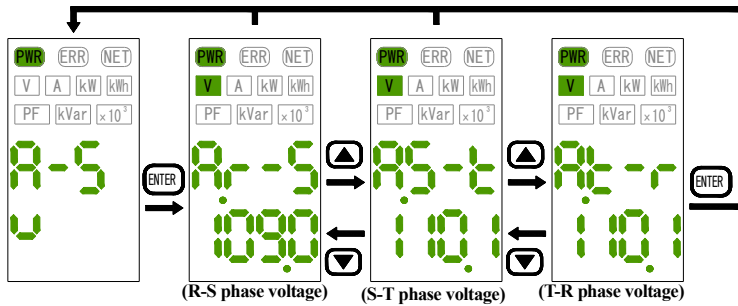
○ Phase display switching when single-phase 2-wire



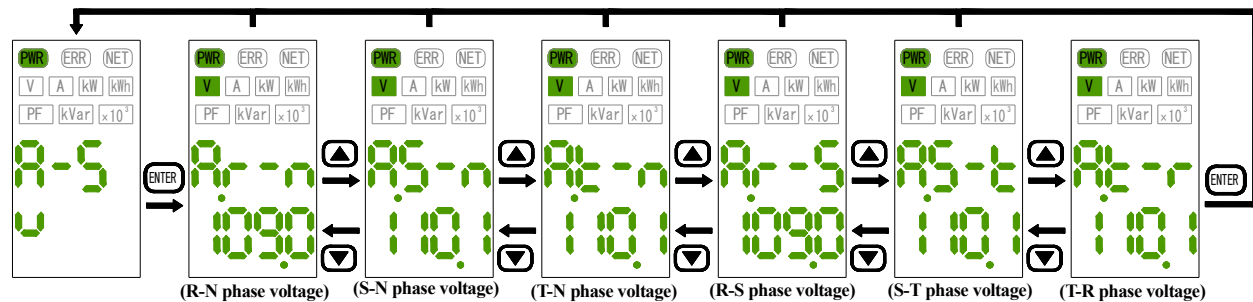
○ Phase display switching when single-phase 3-wire



○ Phase display switching when 3 phases and 3 wires



○ Phase display switching at the time of 3-phase 4-wire

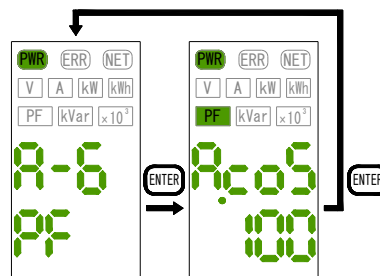


15-8. Power Factor Display [PF]

The Power factor is fixed at 3 integers and displays the Power factor value as a percentage. The lagging Power factor is displayed as an unsigned positive value, and the forward Power factor is displayed as a negative value with a minus sign appended.

* If the virtual Power factor is set, the set value will be displayed fixed.

Display example: In the case of a Power factor of 100% (Delayed Power factor)



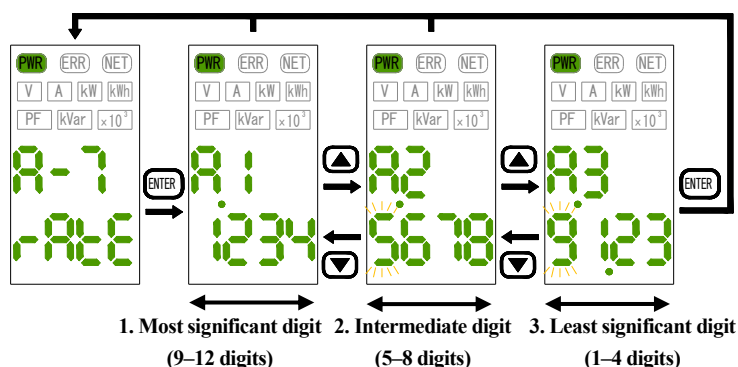
15-9. Conversion value display

The amount of Active power is displayed by multiplying the unit of kWh by the coefficient set in "RATE".

It can be converted into CO2 emissions, etc.

The upper 4 digits + the middle 4 digits + the lower 4 digits, for a total of 12 digits.

The number of digits displayed at one time is 4 digits, and the upper and lower switches are switched between upper, middle, and lower displays by briefly pressing the up and down switches "▲" and "▼".



* If there is a value in the digit above the most significant digit in the display, the most significant digit will flash.

15-10. DI Totalization display

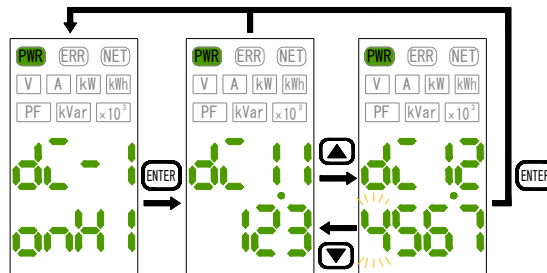
ON-Time Totalization display

The time (minutes) during which the digital/pulse input is turned on is calculated, and the upper 3 digits + 4 lower digits, for a total of 7 digits, is displayed.

The number of digits displayed at one time is 4 digits, and the upper and lower displays are switched by briefly pressing the up and down switches "▲" and "▼".

* This is not displayed for WMS-PE2DO (Equipped with Digital output) models.

Measurement range: 0–5,999,999



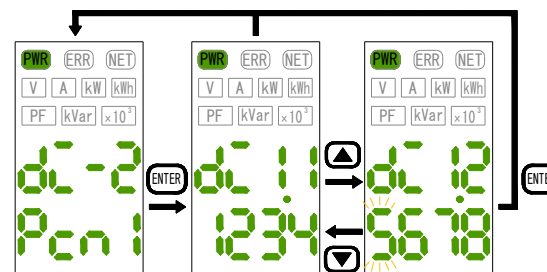
* If there is a value in the digit above the most significant digit in the display, the most significant digit will flash.

Pulse Totalization display

The count value of the digital/pulse input is accumulated, and the upper 4 digits + 4 lower digits, for a total of 8 digits, is displayed.

The number of digits displayed at one time is 4 digits, and the upper and lower displays are switched by briefly pressing the up and down switches "▲" and "▼".

Measurement range: 0–99,999,999



* If there is a value in the digit above the most significant digit in the display, the most significant digit will flash.

16. List of Measurement Items

Measurement item details				Measurement parameters				
No.	Name	Description	Display	Upper display		Name	Lower display	Unit
A-1-D-1	Active Energy (Receiving)	Display Active Energy (Receiving)	kWh	A.1		Circuit A : 1	Most Significant Digit (4 digits)	【kWh】
				A.2		Circuit A : 2	Middle Digit (4 digits)	
				A.3		Circuit A : 3	Least Significant Digit (4 digits)	
A-2-D-2	Active Power	Display Active Power	kW	A.1		Circuit A : 1	Most Significant Digit (3 digits)	【kW】
				A.2		Circuit A : 2	Least Significant Digit (4 digits)	
A-3-D-3	Reactive Power	Display Reactive Power	KVAR	A.1		Circuit A : 1	Most Significant Digit (3 digits)	【kvar】
				A.2		Circuit A : 2	Least Significant Digit (4 digits)	
A-4-D-4	Current	Display Current	A	1P2W	None	Circuit A : 1 Phase Current	1 Phase Current Measurement	【A】
				1P3W	A.1	Circuit A : 1 Phase Current	1 Phase Current Measurement	
					A.2	Circuit A : 2 Phase Current	2 Phase Current Measurement	
					A.N	Circuit A : N Phase Current	N Phase Current Measurement	
				3P3W	A.R	Circuit A : R Phase Current	R Phase Current Measurement	
					A.T	Circuit A : T Phase Current	T Phase Current Measurement	
					A.S	Circuit A : S Phase Current	S Phase Current Measurement	
				3P4W	A.R	Circuit A : R Phase Current	R Phase Current Measurement	
					A.T	Circuit A : T Phase Current	T Phase Current Measurement	
					A.S	Circuit A : S Phase Current	S Phase Current Measurement	
					A.N	Circuit A : N Phase Current	N Phase Current Measurement	
A-5-D-5	Voltage	Display Voltage	V	1P2W	None	Circuit A : 1 Phase Voltage	1 Phase Voltage Measurement	【V】
				1P3W	A.1-N	Circuit A : 1-N Phase Voltage	1-N Phase Voltage Measurement	
					A.2-N	Circuit A : 2-N Phase Voltage	2-N Phase Voltage Measurement	
					A.1-2	Circuit A : 1-2 Phase Voltage	1-2 Phase Voltage Measurement	
				3P3W	A.R-S	Circuit A : R-S Phase Voltage	R-S Phase Voltage Measurement	
					A.S-T	Circuit A : S-T Phase Voltage	S-T Phase Voltage Measurement	
					A.T-R	Circuit A : T-R Phase Voltage	T-R Phase Voltage Measurement	
				3P4W	A.R-N	Circuit A : R-N Phase Voltage	R-N Phase Voltage Measurement	
					A.S-N	Circuit A : S-N Phase Voltage	S-N Phase Voltage Measurement	
					A.T-N	Circuit A : T-N Phase Voltage	T-N Phase Voltage Measurement	
					A.R-S	Circuit A : R-S Phase Voltage	R-S Phase Voltage Measurement	
					A.S-T	Circuit A : S-T Phase Voltage	S-T Phase Voltage Measurement	
					A.T-R	Circuit A : T-R Phase Voltage	T-R Phase Voltage Measurement	
					A.T-R	Circuit A : T-R Phase Voltage	T-R Phase Voltage Measurement	
A-6-D-6	Power Factor	Display Power Factor	PF	A.COS		Circuit A : Power factor	Power factor Measurement	【%】
A-7-D-7	Conversion Value	Display Conversion Value	RATE	A.1		Circuit A : 1	Most Significant Digit (4 digits)	-
				A.2		Circuit A : 2	Middle Digit (4 digits)	
				A.3		Circuit A : 3	Least Significant Digit (4 digits)	
DI-1	DI1 ON-Time Totalization	Display DI1 ON-Time Totalization	ONH1	DI1.1		DI1 ON-Time Totalization : 1	Most Significant Digit (3 digits)	【min】
				DI1.2		DI1 ON-Time Totalization : 2	Least Significant Digit (4 digits)	
DI-2	DI1 Pulse Totalization	Display DI1 Pulse Totalization	PCN1	DI1.1		DI1 Pulse Totalization : 1	Most Significant Digit (4 digits)	【cnt】
				DI1.2		DI1 Pulse Totalization : 2	Least Significant Digit (4 digits)	
DI-3	DI2 ON-Time Totalization	Display DI2 ON-Time Totalization	ONH2	DI2.1		DI2 ON-Time Totalization : 1	Most Significant Digit (3 digits)	【min】
				DI2.2		DI2 ON-Time Totalization : 2	Least Significant Digit (4 digits)	
DI-4	DI2 Pulse Totalization	Display DI2 Pulse Totalization	PCN2	DI2.1		DI2 Pulse Totalization : 1	Most Significant Digit (4 digits)	【cnt】
				DI2.2		DI2 Pulse Totalization : 2	Least Significant Digit (4 digits)	

17. Configuration Modes

By setting each parameter in the setting mode, you can perform the necessary measurement settings.

In the measurement mode, press and hold the "ENTER" switch to enter the setting mode.

While in this mode, power is measured at the set value before changing in this mode.

The parameters changed in this mode are confirmed when you return to the measurement mode by pressing and holding the "ENTER" switch.

If the power is shut off before entering measurement mode, or if the "MODE/▶" switch is pressed and held, the changed setting value will be discarded.

If you change the settings by mistake, perform the settings again.

Numeric input: Select the setting value by using the "▲" and "▼" switches.

Numerical input: Use the "MODE/" switch to move the setting digits, and the "▲" ▶ and "▼" switches to increase or decrease the set value.

Operations in setup mode				
				Operation details
○	○			Switching between setting items, selecting setting values
		○		Switching the type of settings
		⊙		Discarding provisionally decided changes (*After discarding, transition to measurement mode)
			○	Transitioning to setting value input/executing functions. Provisionally deciding the selected setting value and moving to the next setting item.
			⊙	Saving provisionally decided changes (*After saving, transition to measurement mode)
Operation during setting input				
○	○			Increase or decrease the value of the specified digits (numeric input)
		○		Move the specified digits (numeric input), select a setting value
			○	Transition to setting input / execute functionality. Return from the setting input screen to the setting item screen.
			⊙	Execution action

17-1. Switching the setting type

The name of the setting type is displayed when the transition from the measurement mode to the setting mode is displayed.

(The POWER LED flashes during setting mode.)

When you switch to the setting mode, the common settings for circuits A–D are displayed as the initial display.

On the display of the setting type, short press the "▼" switch to switch to the next setting type, and short press the "▲" switch to switch to the previous setting type.

Short press the "ENTER" switch to move to each Setting.

Short press the "MODE/▶" switch on the Setting display to return to the display of the setting type.

Press and hold the "ENTER" switch to confirm the settings and return to the measurement mode.



* In the case of WMS-PE2DO (Digital output), "Pulse Output Setting" is displayed as a Setting, and in the case of WMS-PE2DI (Digital input), "Pulse Input Setting" is displayed as a Setting.

No.	Setting Type	Content
1	U-AL	Unit Common Settings
2	U-A	Unit A
3	U-B	Unit B
4	U-C	Unit C
5	U-D	Unit D
6	RTU	Modbus Communication Settings
7	POUT	Pulse Output Settings
(Apply either one depending on the model)	PIN	Digital/Pulse Input Settings
	ETC	Others

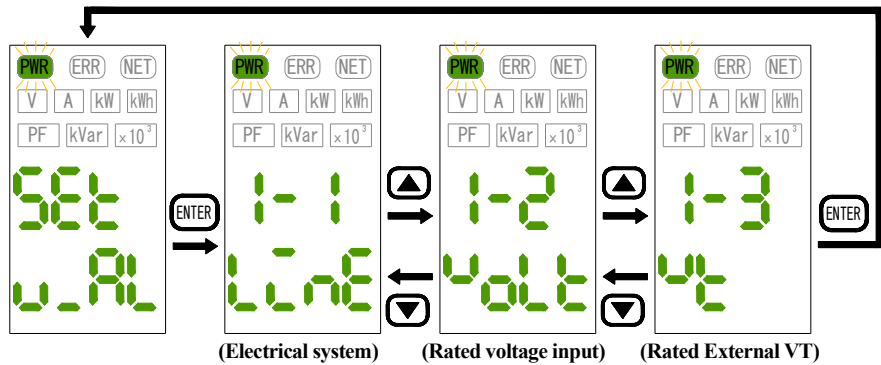
* Depending on the setting of the Electrical systems, the display will be skipped for the setting type of the circuit for which the measurement display is not possible.

17-2. Common circuit settings

Set all common parameters (Electrical systems, Rated Voltage Input, External VT rating) of circuit A – circuit D.

Short press the "▲" and "▼" switches to switch the Setting.
Short press the "ENTER" switch on each Setting display to move to the parameter setting display.
Short press the "ENTER" switch again to return to the setting type display.

When the "ENTER" switch is pressed and held to confirm the settings, "SAVE" flashes and the system enters measurement mode.



17-2-1. "1-1. **LINE** Electrical systems setting" (Default: 3P3W)

Select the phase indicator from the following:
* For measurable circuits by Electrical systems, refer to the correspondence table in "15-2 Circuit switching".

Setting: Single-phase 2 wires / Single-phase 3 wires / Three-phase 3 wires / Three-phase 4 wires /
Single-phase 2 wires / Single-phase 3 wires branched from single-phase 3 wires + Single-phase 2 wires

⚠ Caution

If you change the Electrical systems, the following setting values will return to the default values, so please be careful when changing them.

▪ Circuit Enable/Disable Setting (Default)	Circuit A: Enabled, Circuit B–D: Disabled
▪ Output operation selection (Default)	OFF
▪ Alarm circuit assignment (Default)	A
▪ Alarm kW/A (Default)	kW

17-2-2. "1-2. **VOLT** Rated Voltage Input setting" (Default: 220)

Select the Rated Voltage Input from the following:

Setting: 110 V/220 V

⚠ Caution

When the Rated Voltage Input is changed, the External VT rating becomes the same as this setting. Please be careful when changing the settings.

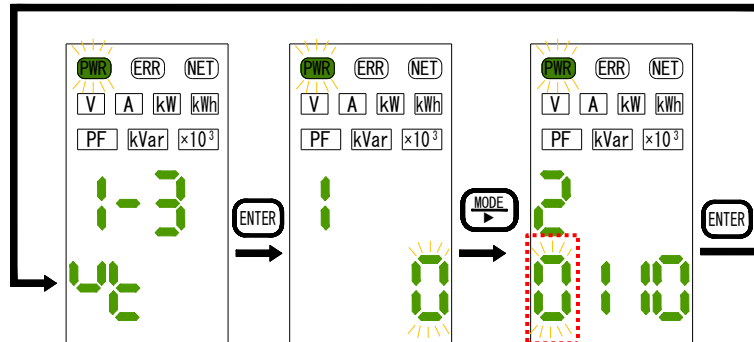
17-2-3. "1-3. External VT rating setting" (Default: 220)

Sets the External VT rating to the specified value. Set the Rated Voltage Input $\leq$ External VT rating.

When Voltage-less measurement is turned on, this setting value is used as the input voltage.

* If the above conditions are not satisfied, "Err" will be displayed on the upper display and the setting will be disabled.

Configurable range: 110–77000 V



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1 digit, and the "▼" switch to decrease the blinking digit by 1 digit.

17-3. Individual circuit setting

Perform individual settings for Circuit A – Circuit D.

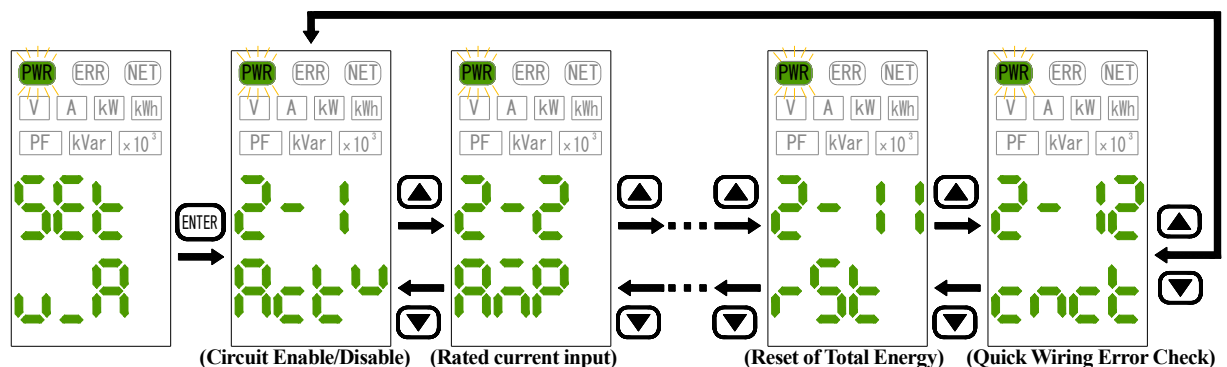
Short press the "ENTER" switch on the setting type display to switch to the individual circuit Setting.

Short press the "▲" and "▼" switches to switch the Setting.

Short press the "ENTER" switch on each Setting display to switch to the parameter setting display.

Short press the "ENTER" switch again to return to the setting type display.

The figure below shows the Setting for circuit A. (Please refer to Table ○ for details of Setting.)



17-3-1. "2-1-5-1. Circuit Enable/Disable Setting"

(Default: Circuit A Enabled, Circuit B Disabled, Circuit C Disabled, Circuit D Disabled)

Select Enable (ON) or Disable (OFF) for each circuit.

* If all circuits are disabled, "Err1" will be displayed at the stage of confirming the setting by pressing and holding the "ENTER" switch, and the setting will be disabled.

17-3-2. "2-2-5-2. Rated Current Input" (Default: 600)

Select the Rated Current Input for each circuit from the following.

Setting: 5A/50 A/100 A/200 A/400 A/600 A

Caution

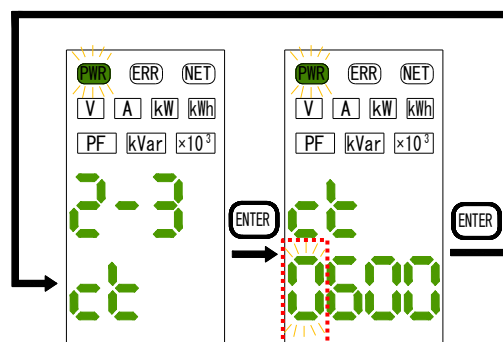
When the Rated Current Input is changed, the external CT rating becomes the same as this setting value. Please be careful when changing the settings.

17-3-3. "2-3-5-3. External CT Rating" (Default: 600)

Sets the external CT rating of each circuit to the specified value. Set the Rated Current Input $\leq$ external CT rating.

* If the above conditions are not satisfied, "Err" will be displayed on the upper display and the setting will be disabled.

Configurable range: 5–9999 A



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1 digit, and the "▼" switch to decrease the blinking digit by 1 digit.

17-3-4. "2-4-5-4. Digital/Pulse output pin assignment" (Default: OFF) *WMS-PE2DO only

Select the DO output terminal to which you want to assign a power pulse for each circuit.

Setting: OFF/OUT1/OUT2

When the same DO output pin is assigned from multiple circuits, the total amount of Totalized power is added up and digital/pulse output is performed.

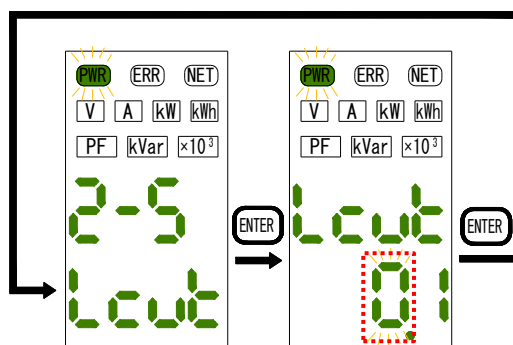
17-3-5. "2-5-5-5. Current Low Cut" (Default: 0.1)

Set the current low-cut value of each circuit to the specified value.

The measured value of the current less than the set numerical % is forcibly set to 0 A.

It is possible to cut the current measured by inductive noise, etc., so please set an appropriate value and use it.

Configurable range: 0.0–9.9%



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1 digit, and the "▼" switch to decrease the blinking digit by 1 digit.

17-3-6. "2-6-5-6. Measured voltage setting" (Default: 1-N)

Select from the following where the load between the single-phase 3 wires is to be measured.

* This setting can only be set for single-phase 2-wire circuit A/B/C/D, or single-phase 3-wire + single-phase 2-wire circuit C/D with a Electrical systems branched from single-phase 3-wire.

Setting: 1-N / 2-N / 1-2

17-3-7. "2-7-5-7. Voltage-less measurement ON/OFF" (Default: OFF)

Select the Voltage-less measurement ON/OFF for each circuit.

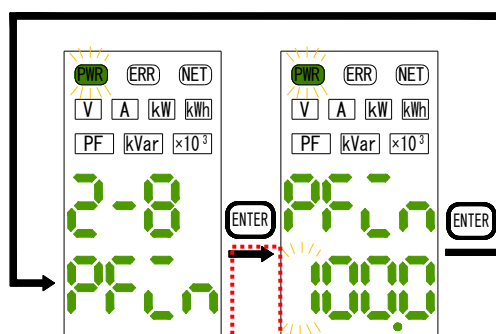
* Circuits with Voltage-less measurement turned on operate with the External VT rating as the voltage value.

Setting: OFF/ON

17-3-8. "2-8-5-8. Virtual Power Factor" (Default: 100.0)

Sets the virtual Power factor of each circuit to the specified value.

Configurable range: 0.0–100.0%



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1 digit, and the "▼" switch to decrease the blinking digit by 1 digit.

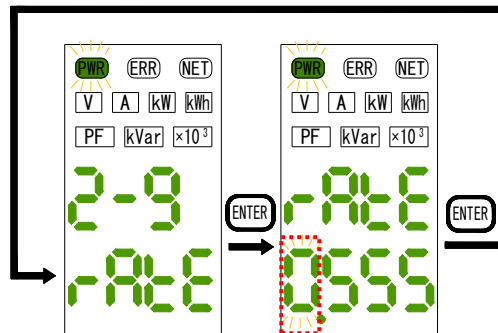
* If the setting of "2-7-5-7.Voltage-less measurement ON/OFF" is OFF, the setting value of the virtual Power factor will be disabled.

17-3-9. "2-9-5-9. Conversion Coefficient" (Default: 0.555)

Sets the Conversion Coefficient for each circuit to the specified value.

It can be converted into CO2 emissions by multiplying the coefficient set in kWh units of the amount of effective electricity.

Configurable range: 0.000–9.999



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1 digit, and the "▼" switch to decrease the blinking digit by 1 digit.

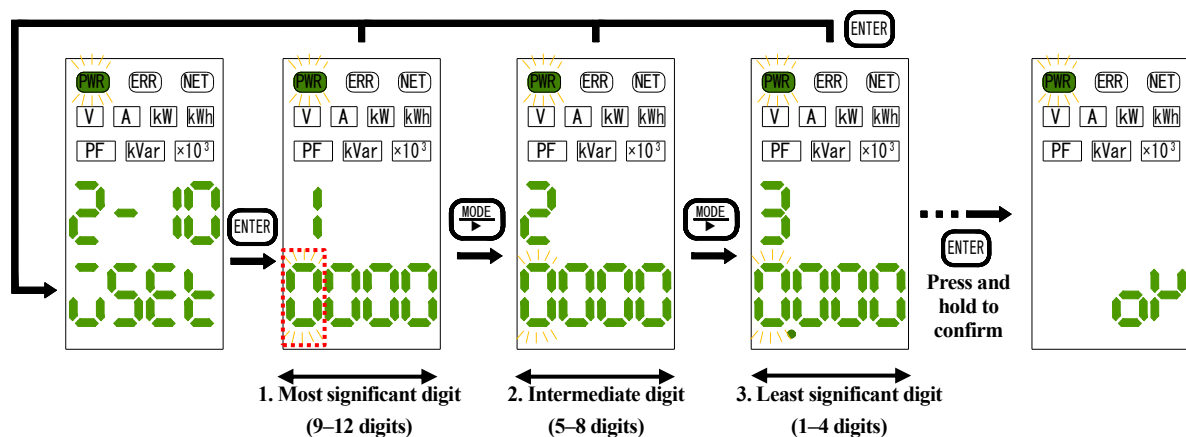
17-3-10. "2-10-5-10. Energy Preset" (Default: 0.000)

Sets the value of the Active energy of each circuit to the specified value.

Set the preset value with a fixed decimal point position

and a number of upper 4 digits + middle 4 digits + lower 4 digits = a total of 12 digits.

Configurable range: 0.000–999,999,999.999



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, "▲" switch to increase the blinking digit by 1, "▼" switch to decrease the blinking digit by 1. Press and hold the "ENTER" switch to execute the preset.

If the preset is successful, "OK" will be displayed and the preset value will be reflected.

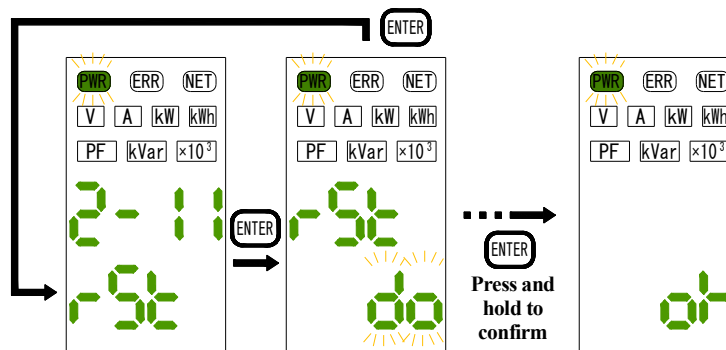
Short press the "ENTER" switch to return to the Setting display.

17-3-11. "2-11-5-11. Reset the amount of Total Energy"

Clears the Active power amount of each circuit by zero.

Press and hold the "ENTER" switch to perform 0 clearing.

If 0 is successfully cleared, "OK" is displayed and the Active power amount is reduced to 0.



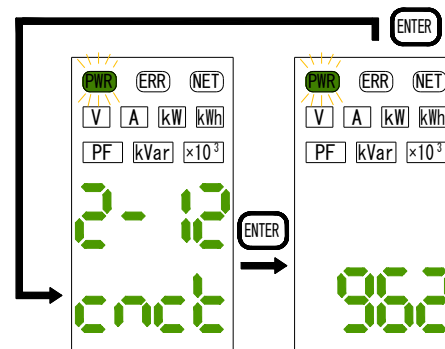
17-3-12. "2-12-5-12. Quick Wiring Error Diagnosis"

A simple wiring diagnosis is performed, and the diagnosis result is displayed in the 8 digits of the upper and lower rows of the 7-segment LED.

(Diagnosis results)

- 0 : Power > 0 (power received) *Normal state
- 1 : Less than 20% of the apparent power calculated from the power < current and voltage
- 2 : Power = 0 (no load)
- 3 : Power < 0 (power transmission)
- 4 : S-phase current less than 3%
- 5 : T(2) phase current less than 3%
- 6 : R(1) phase current less than 3%
- 7 : Voltage input between T-R and less than 80%
- 8 : S-T (2-N) voltage input less than 80%
- 9 : Voltage input between R-S (1-N) and less than 80%
- A : Voltage input between T-R and less than 10%
- B : Voltage input between S-T (2-N) is less than 10%
- C : Voltage input between R-S (1-N) and less than 10%

*Only one of 0–3 occurs.



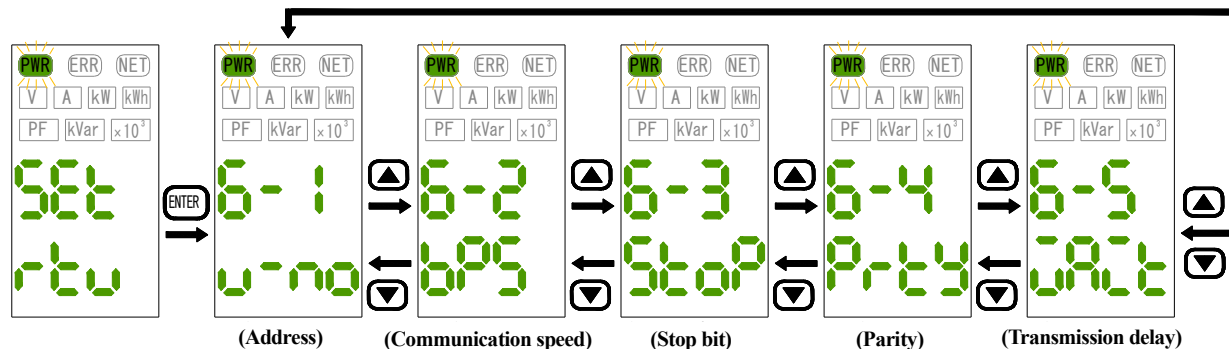
Example of simple diagnostic results for single-phase 2-wire (voltage rating 220 V, current rating 5 A)

- 9 : Voltage input rated less than 80% (220 V)
- 6 : Current input rated less than 3% (5A)
- 2 : Power 0 (no load)

18. Communication Settings

This item sets the parameters for Modbus RTU (RS485) communication.

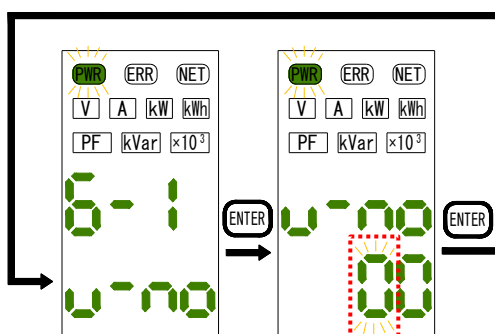
As with other Setting, short press the "▲" and "▼" switches to switch between Setting, and the "ENTER" switch switches to switch to the parameter setting display.



18-1-1. "6-1. u-no Address" (Default: 0)

Set the Modbus address of the instrument to the specified value.

Configurable range: 00–99



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

18-1-2. "6-2. bps Communication speed" (Default: 19.2k)

Select the communication speed (baud rate) from the following.

Setting: 4.8K/9.6K/19.2K/38.4K

18-1-3. "6-3. Stop Stop Bits" (Default: 1)

Select the stop bit length from the following.

Setting: 1/2 (can be set only when parity is not available)

18-1-4. "6-4. Prty Parity" (Default: EVEN)

Select the parity from the following:

* If parity is set to anything other than NONE, the stop bit will be automatically changed to 1 bit.

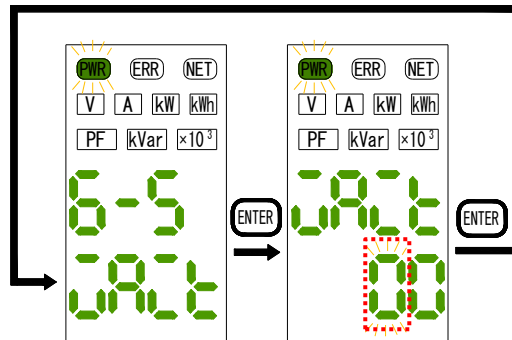
Setting: NONE (none) / ODD (odd number) / EVEN (Even number)

18-1-5. "6-5. Transmission Delay Time" (Default: 0)

Sets the latency for sending communication data to the specified value.

After receiving the Modbus communication data, it waits for a set time before responding.

Configurable range: 0–99



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

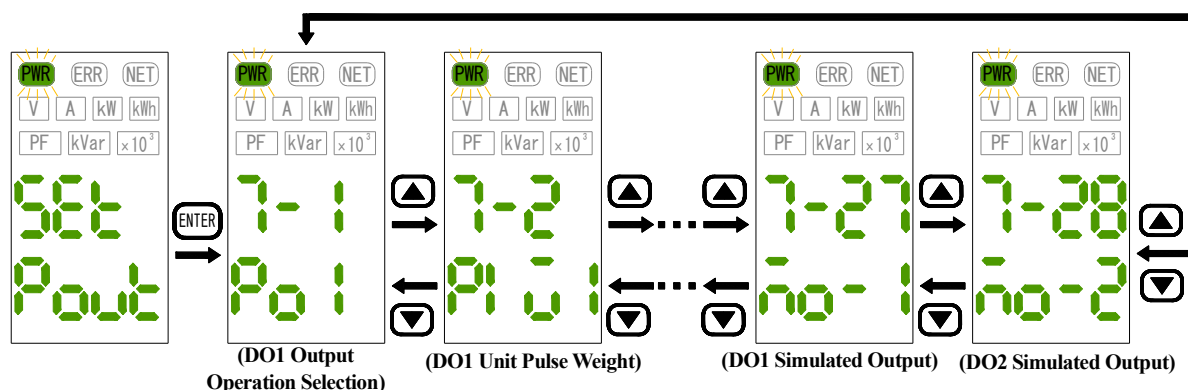
19. Digital/Pulse Output Settings *WMS-PE2DO only

This setting is valid only for the WMS-PE2DO (Digital/pulse output). DO1 and DO2 can be individually configured. The operation of DO1 and DO2 can be selected as either an Totalized digital/pulse output or an alarm output. Depending on the action you select, the items that can be set differ.

Short press the "▲" and "▼" switches to switch the Setting.

Short press the "ENTER" switch on each Setting display to switch to the parameter setting display.

Short press the "ENTER" switch again to return to the setting type display.



19-1-1. "7-1. **Po1** DO1 Output Operation Selection", "7-14. **Po2** DO2 Output Operation Selection" (Default: OFF)

Select the output operation of DO1 and DO2 from the following.

Setting: OFF (none) / PULS (Totalized pulse output) / ALM (alarm output)

19-1-2. "7-2. **PU1** DO1 Unit Pulse Weight Setting", "7-15. **PU2** DO2 Unit Pulse Weight Setting" (Default: 0.1)

Select the unit pulse weights for DO1 and DO2 from the following.

Setting: 0.001/0.01/0.1/0.5/1/10/100kW

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	PULS
7-14	DO2 Output Operation Selection	PULS

19-1-3. "7-3. **PUD1** DO1 Digital/Pulse Output Width Setting", "7-16. **PUD2** DO2 Digital/Pulse Output Width Setting" (Default: 1000)

Select the Digital/pulse output width of DO1 and DO2 from the following.

Setting: 100/250/500/1000 ms

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	PULS
7-14	DO2 Output Operation Selection	PULS

19-1-4. "7-4. **ALN1** DO1 Alarm Circuit Assignment", "7-17. **ALN2** DO2 Alarm Circuit Assignment" (Default: A)

Select the circuit to be the target of the DO1 and DO2 alarm outputs from the following.

* Only circuits corresponding to the Electrical systems set in the common circuit settings are displayed.

Setting: A/B/C/D

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-14	DO2 Output Operation Selection	ALM

19-1-5. "7-5. DO1 Alarm HI/LO Setting", "7-18. DO2 Alarm HI/LO Settings" (Default: HI)

Select the HI/LO of the alarm outputs of DO1 and DO2. (HI: Alarm output at or above the Threshold, LO: Alarm output at or below the Threshold)

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-14	DO2 Output Operation Selection	ALM

Setting: HI/LO

19-1-6. "7-6. DO1 Alarm kW/A Setting", "7-19. DO2 Alarm kW/A Setting" (Default: kW)

Select the output element for the DO1 and DO2 alarm outputs.
* Only circuits corresponding to the Electrical systems set in the common circuit settings are displayed.

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-14	DO2 Output Operation Selection	ALM

Setting: kW/A

19-1-7. "7-7. DO1 Alarm HI Threshold (Active Power Setting)",
"7-20. DO2 Alarm HI Threshold (Active Power Setting)" (Default: 9,999.999)

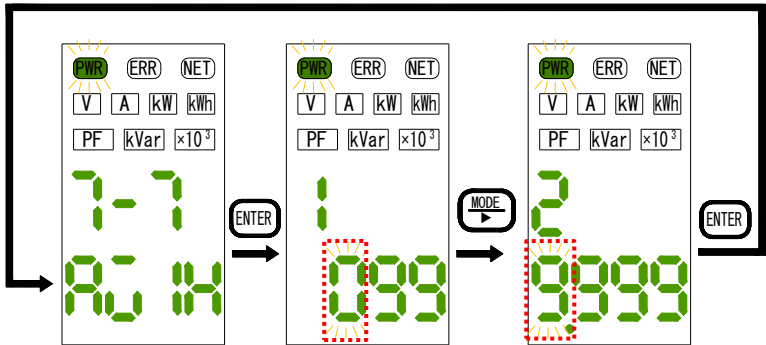
Set the alarm HI Threshold of DO1 and DO2 with the specified value of Active power.
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated power	Display digits
Less than 6 MW	±XXXX.XXX
6 MW or more – Less than 60 MW	±XXXXX.XX
60 MW or more – less than 600 MW	±XXXXXX.X
600 MW or more –	±XXXXXXX

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-5	DO1 Alarm HI/LO Setting	HI
7-6	DO1 Alarm kW/A setting	kW
7-14	DO2 Output Operation Selection	ALM
7-18	DO2 Alarm HI/LO Setting	HI
7-19	DO2 Alarm kW/A setting	kW

Configurable range: ±9,999,999



When you move to the numeric input display, the most significant digit flashes.
Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

- 19-1-8. "7-8.  DO1 Alarm HI Threshold (Phase Current Setting)",
 "7-21.  DO2 Alarm HI Threshold (Phase Current Setting)" (Default: kW)

Set the alarm HI Threshold of DO1 and DO2 with the specified value of the phase current.

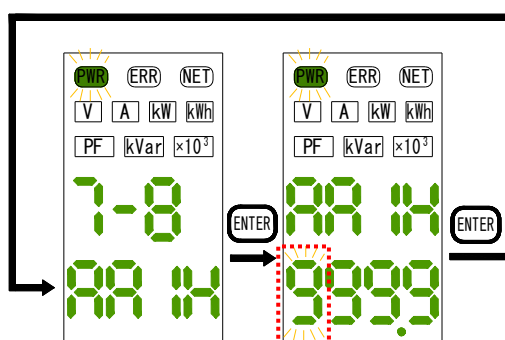
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated External CT	Display digits
5 – 80 A or less	XX.XX
81 – 800 A or less	XXX.X
801 – 9999 A or less	XXXX

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-5	DO1 Alarm HI/LO Setting	HI
7-6	DO1 Alarm kW/A setting	Phase current designation
7-14	DO2 Output Operation Selection	ALM
7-18	DO2 Alarm HI/LO Setting	HI
7-19	DO2 Alarm kW/A setting	Phase current designation

Configurable range: 0–9999



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

- 19-1-9. "7-9.  DO1 Alarm LO Threshold (Active Power Setting)",
 "7-22.  DO2 Alarm LO Threshold (Active Power Setting)" (Default: -9,999.999)

Set the alarm LO Threshold of DO1 and DO2 with the specified value of Active power.

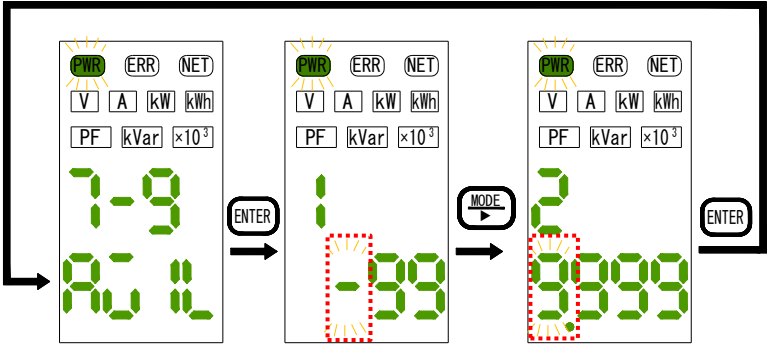
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated External CT	Display digits
Less than 6 MW	±XXXX.XXX
6 MW or more – Less than 60 MW	±XXXXX.XX
60 MW or more – less than 600 MW	±XXXXXX.X
600 MW or more –	±XXXXXXX

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-5	DO1 Alarm HI/LO Setting	LO
7-6	DO1 Alarm kW/A setting	kW
7-14	DO2 Output Operation Selection	ALM
7-18	DO2 Alarm HI/LO Setting	LO
7-19	DO2 alarm kW/A setting	kW

Configurable range: ±9,999,999



When you move to the numeric input display, the most significant digit flashes.
Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

19-1-10. "7-10. **AA IL** DO1 Alarm LO Threshold (Phase Current Setting)",
"7-23. **AA2L** DO2 Alarm LO Threshold (Phase Current Setting)" (Default: kW)

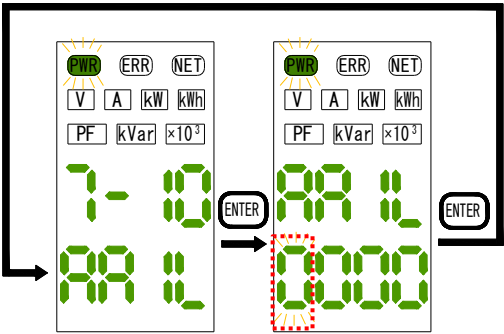
The alarm LO Threshold of DO1 and DO2 is set to the specified value of the phase current.
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated External CT	Display digits
5 – 80 A or less	XX.XX
81– 800 A or less	XXX.X
801–9999 A or less	XXXX

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-5	DO1 Alarm HI/LO Setting	HI
7-6	DO1 Alarm kW/A setting	Phase current designation
7-14	DO2 Output Operation Selection	ALM
7-18	DO2 Alarm HI/LO Setting	HI
7-19	DO2 alarm kW/A setting	Phase current designation

Configurable range: 0–9999



When you move to the numeric input display, the most significant digit flashes.
Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

19-1-11. "7-11. **H5G1** DO1 Hysteresis Width (Active Power Setting)",
 "7-24. **H5G2** DO2 Hysteresis Width (Active Power Setting)" (Default: 0)

Sets the hysteresis width of DO1 and DO2 with the specified value of Active power.

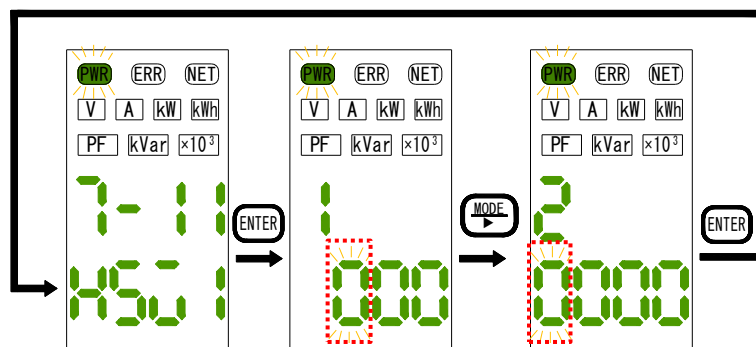
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated External CT	Display digits
Less than 6 MW	±XXXX.XXX
6 MW or more – Less than 60 MW	±XXXXX.XX
60 MW or more – less than 600 MW	±XXXXXX.X
600 MW or more –	±XXXXXXX

Configurable range: 0–9,999,999

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-6	DO1 Alarm kW/A setting	kW
7-14	DO2 Output Operation Selection	ALM
7-19	DO2 alarm kW/A setting	kW



When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

19-1-12. "7-12. **H5A1** DO1 Hysteresis Width (Phase Current Setting)",
 "7-25. **H5A2** DO2 Hysteresis Width (Phase Current Setting)" (Default: 0)

The hysteresis width of DO1 and DO2 is set by the specified value of the phase current.

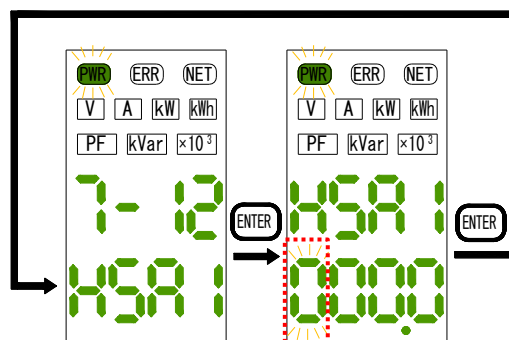
The display digits and decimal points are fixed for each rated power and are as shown in the table below.

Rated External CT	Display digits
5 – 80 A or less	XX.XX
81– 800 A or less	XXX.X
801–9999 A or less	XXXX

Configurable range: 0–9,999

Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-6	DO1 Alarm kW/A setting	kW
7-14	DO2 Output Operation Selection	ALM
7-19	DO2 alarm kW/A setting	kW



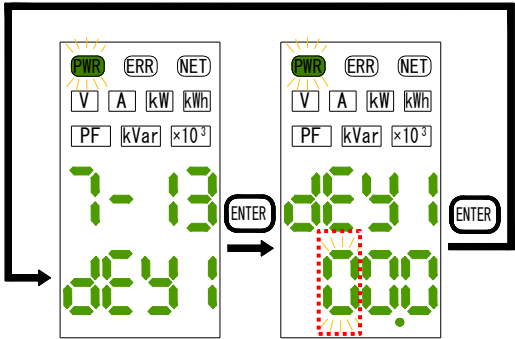
When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

19-1-13. “7-13. DO1 Output OFF Delay”, “7-26. DO2 Output OFF Delay” (Default: 0)

Specify the delay time before the alarm outputs of DO1 and DO2 are turned off.

Configurable range: 0–99.9s



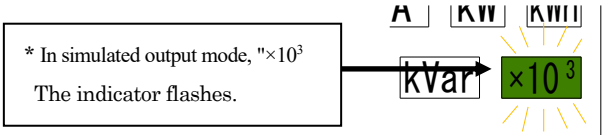
Available when the following setting is enabled.

No.	Name	Setting
7-1	DO1 Output Operation Selection	ALM
7-14	DO2 Output Operation Selection	ALM

When you move to the numeric input display, the most significant digit flashes.
Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

19-1-14. “7-27. DO1 Simulated Output”, “7-28. DO2 Simulated Output” (Default: OFF)

Set the ON/OFF of the simulated output of DO1 and DO2.
When ON is selected, DO is forcibly turned on



* The simulated output will be canceled when you exit from this Setting or turn off the power.

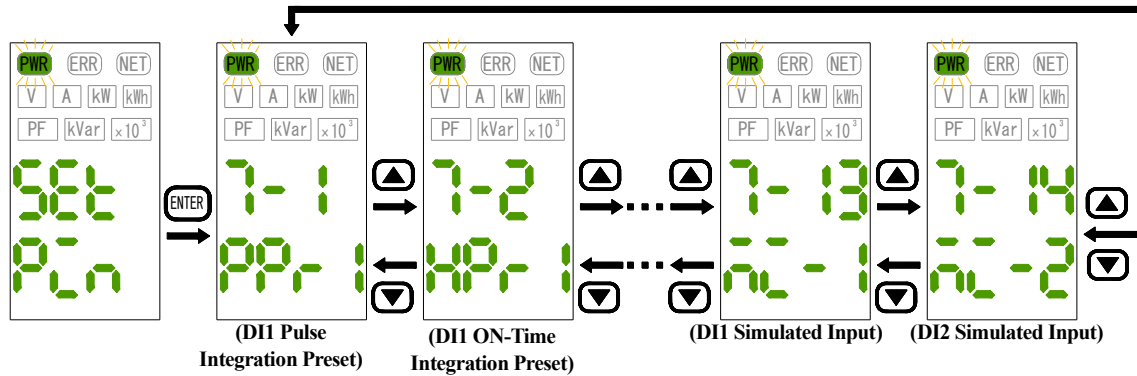
20. Digital/Pulse Input Settings *WMS-PE2DI only

This setting is valid only for WMS-PE2DI (Digital/pulse input). DI1 and DI2 can be individually configured.

Short press the "▲" and "▼" switches to switch the Setting.

Short press the "ENTER" switch on each Setting display to switch to the parameter setting display.

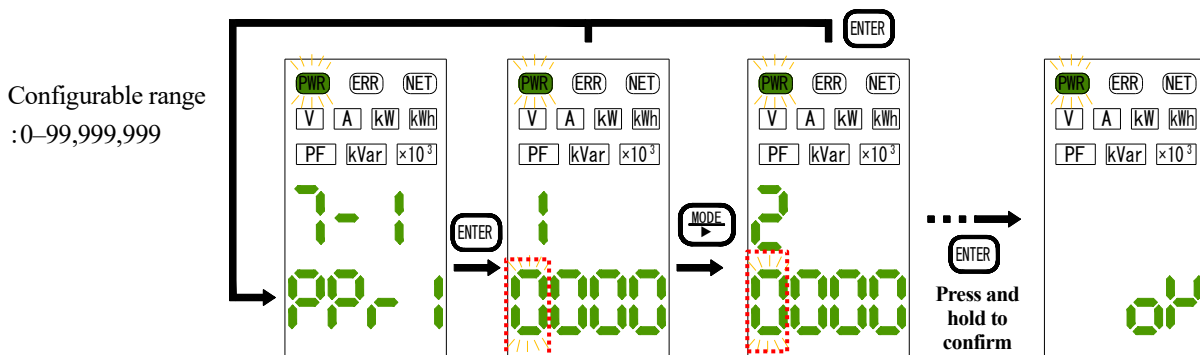
Short press the "ENTER" switch again to return to the setting type display.



20-1-1. "7-1. **PP-1** DI1 Pulse Totalization Preset", "7-7. **PP-2** DI2 Pulse Integrator Preset" (Default: 0)

Set the preset of the Pulse Totalization of DI1 and DI2 with the specified value. Press and hold the "ENTER" switch to run the preset.

If the preset is successful, "OK" is displayed and the Pulse Totalization is changed to the set value.

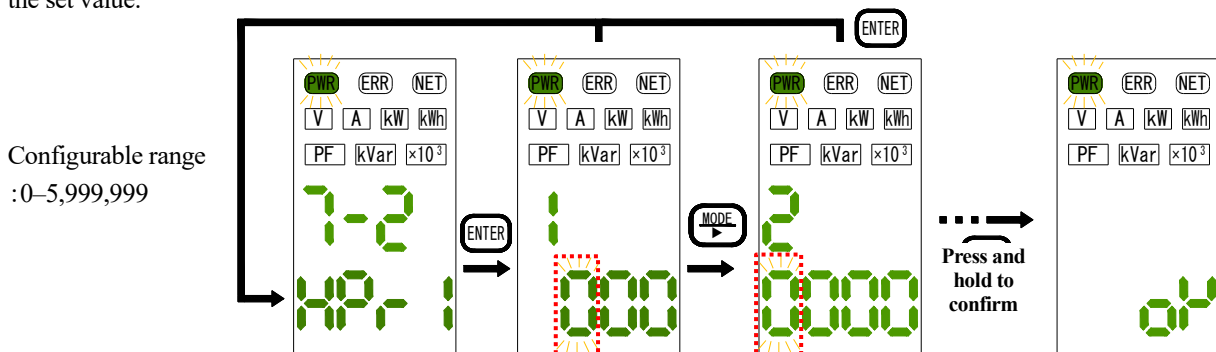


When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, "▲" switch to increase the blinking digit by 1, "▼" switch to decrease the blink digit by 1. Short press the "ENTER" switch to return to the Setting display.

20-1-2. "7-2. **HP-1** DI1 ON-Time Totalization Preset", "7-8. **HP-2** DI2 ON-Time Totalization Preset" (Default: 0)

Set the preset of the ON-Time Totalization of DI1 and DI2 with the specified value. Press and hold the "ENTER" switch to run the preset. If the preset is successful, "OK" is displayed, and the ON-Time Totalization is changed to the set value.



When you move to the numeric input display, the most significant digit flashes.

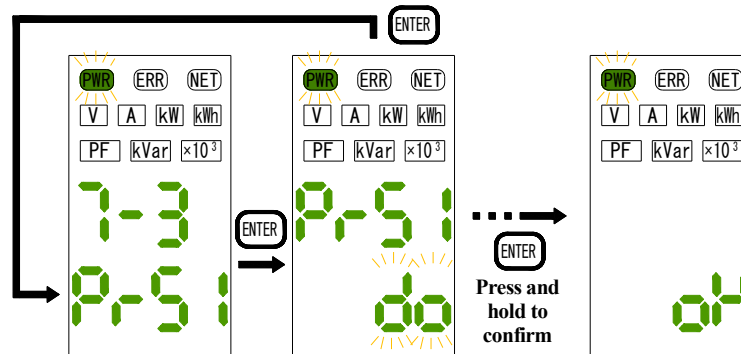
Short press the "MODE/▶" switch to move the setting digit to the right, "▲" switch to increase the blinking digit by 1, "▼" switch to decrease the blink digit by 1. Short press the "ENTER" switch to return to the Setting display.

20-1-3. "7-3. PrS1 DI1 Pulse Totalization Reset", "7-9. PrS2 DI2 Pulse Totalization Reset"

Clears the Pulse Totalizations of DI1 and DI2 by zero.

Press and hold the "ENTER" switch to perform 0 clearing.

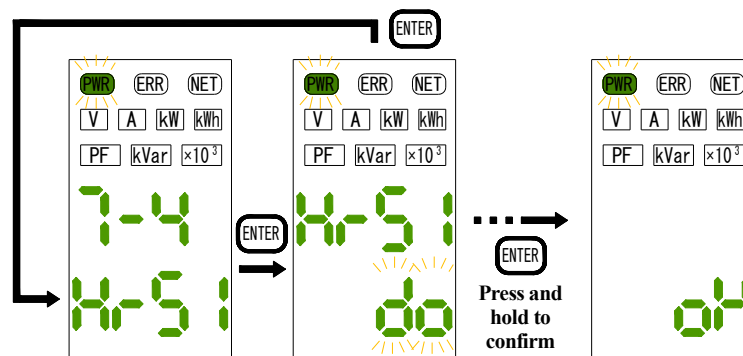
If 0 is successfully cleared, "OK" is displayed and the Pulse Totalization becomes 0.


20-1-4. "7-4. HrS1 DI1 ON-Time Totalization Reset", "7-10. HrS2 DI2 ON-Time Totalization Reset"

Clear the ON-Time Totalizations of DI1 and DI2 by zero.

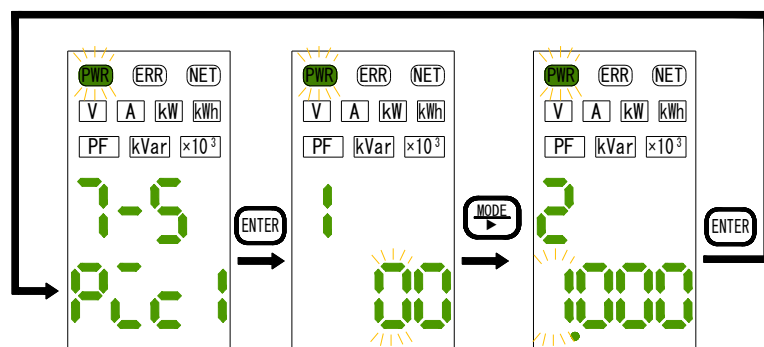
Press and hold the "ENTER" switch to perform 0 clearing.

If clearing 0 is successful, "OK" is displayed, and the ON-Time Totalization is 0.


20-1-5. "7-5. Plc1 DI1 Pulse Totalizing Coefficient", "7-11. Plc2 DI2 Pulse Totalization Factor"
 (Default: 1.000)

Set the Pulse Totalization coefficients of DI1 and DI2 to the specified values.

Configurable range: 0.001–100.000

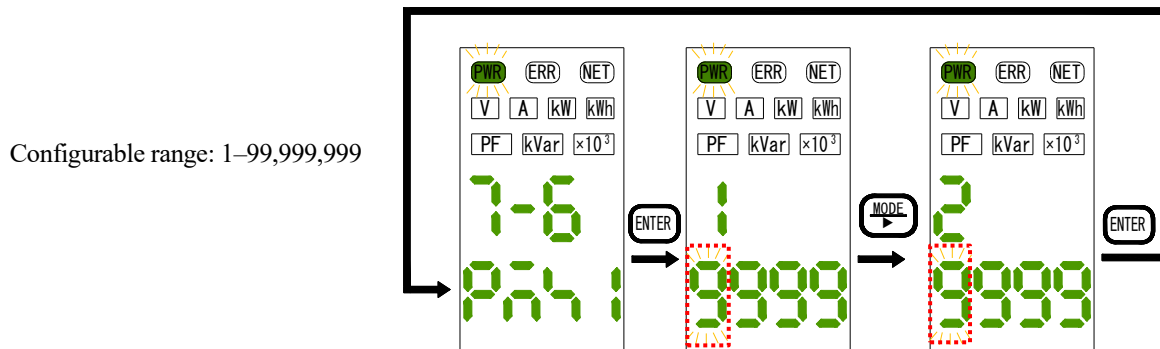


When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

20-1-6. "7-6. DI1 Pulse Totalizing Max. Value", "7-12. DI2 Pulse Totalization Max." (Default: 99,999,999)

Set the Max. Pulse Totalizations of DI1 and DI2 to the specified values.

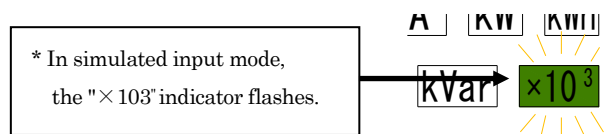


When you move to the numeric input display, the most significant digit flashes.

Short press the "MODE/▶" switch to move the setting digit to the right, the "▲" switch to increase the blinking digit by 1, and the "▼" switch to decrease the blinking digit by 1.

20-1-7. "7-13. DI1 Simulated Input", "7-14. DI2 Simulated Input" (Default: OFF)

Set the DI1 and DI2 simulated inputs to ON/OFF.
When ON is selected, DO is forcibly turned on.



- * The simulated input will be canceled when you exit from this Setting or turn off the power.
- * When the simulated input is in the ON state, the DI LED does not light up.
- * During simulated input, the DI accumulation operation will stop and will not be counted.

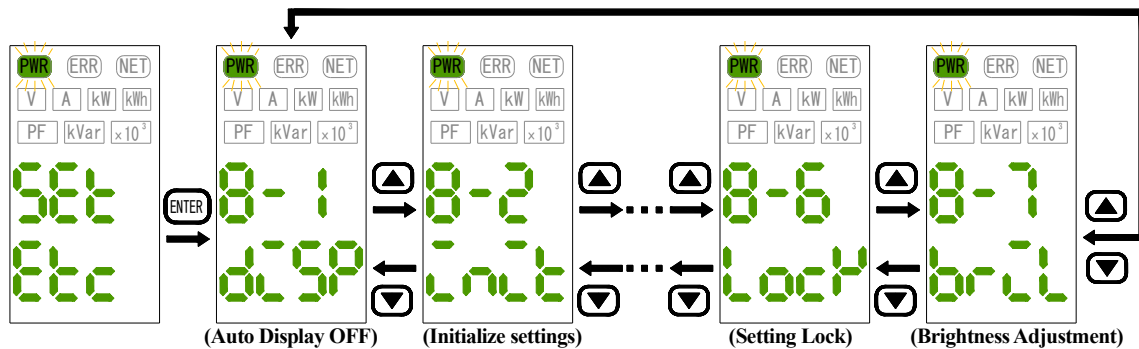
21. Other Settings

This is an item for adjusting the brightness and setting initialization, etc.

Short press the "▲" and "▼" switches to switch the Setting.

Short press the "ENTER" switch on each Setting display to switch to the parameter setting display.

Short press the "ENTER" switch again to return to the setting type display.



21-1-1. "8-1. Auto Display OFF" (Default: OFF)

Select the time before the light turns off automatically.

If there is no switch operation in the measurement mode during the set time, the display except "PWR" is turned off.

Setting: OFF/1.0/5.0/10.0 (minutes)

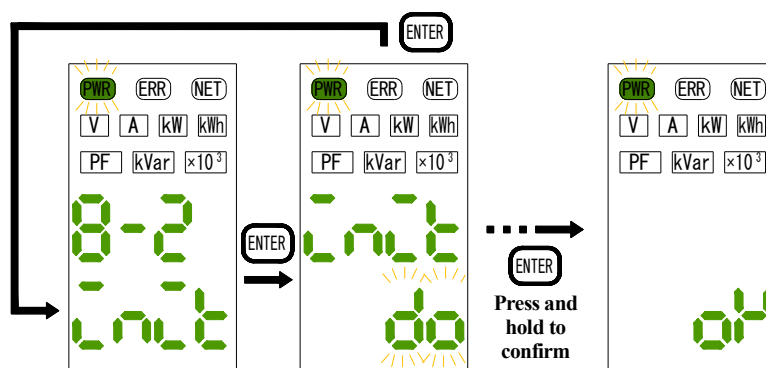
21-1-2. "8-2. Initialize Settings"

All settings are set to the factory default state (initialization).

Press and hold the "ENTER" switch to perform initialization.

If 0 is successfully cleared, "OK" is displayed and the setting value is initialized.

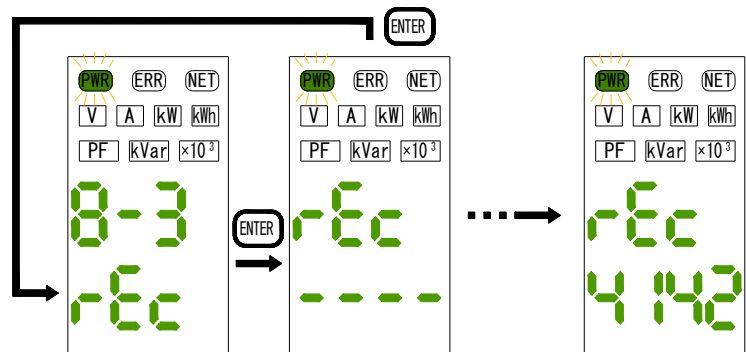
* The initialized setting value is saved when you return to the measurement mode by pressing and holding the "ENTER" switch.



21-1-3. "8-3. Communication Reception Test"

Test receiving communications. When testing, send Modbus data from the Master device to the instrument.
When data is received, it displays the received data.

Example: When the string "AB" is received
ASCII code for A 41h (hex)
ASCII code for B 42h (hex)



From the above example, "4142" is displayed on the display.

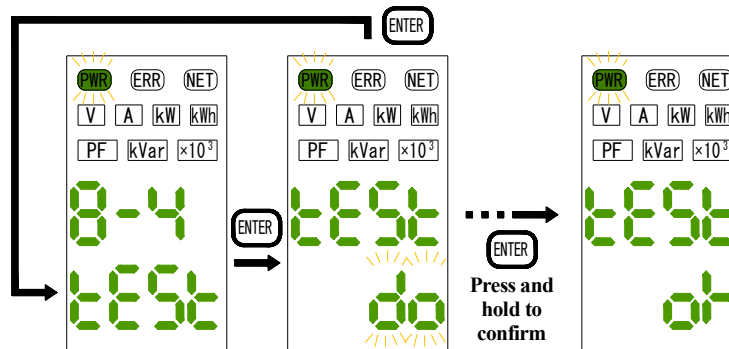
During the reception test, all data is received ignoring the communication address.

It also ignores the data format of Modbus RTU and displays the received data as it is in hex.

21-1-4. "8-4. Communication Transmission Test"

Test the transmission of the communication.

Press and hold the "ENTER" switch to send the string "TEST" (ASCII code: 54h 45h 53h 54h).

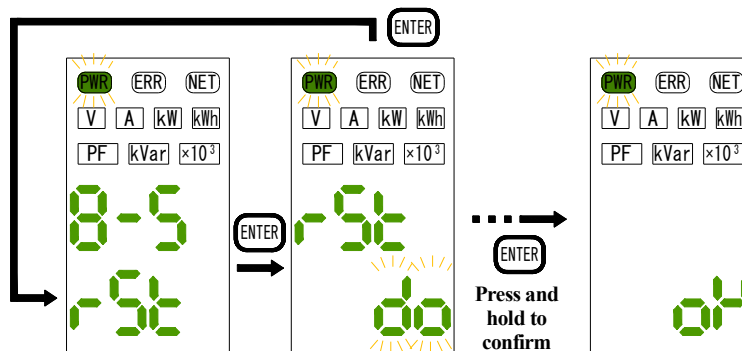


21-1-5. "8-5. Reset Total Energy (All)"

Clears the Active power amount of all circuits to 0.

Press and hold the "ENTER" switch to perform 0 clearing.

If 0 is successfully cleared, "OK" is displayed and the Active power of all circuits is reduced to 0.



21-1-6. "8-6. Setting Protection" (Default: OFF)

Select whether to enable or disable Configuration Protect.

When Configuration Protect is enabled, it prohibits the following modification operations:

- Set value
- Initialization of setting values

If the above setting is changed while the Setting Protection is enabled, "LOCK" will be displayed at the top to disable the change.

21-1-7. "8-7. Brightness Adjustment" (Default: TYP)

Select the brightness of the LED from the following.

You can change the LED brightness by changing the brightness in this setting.

Setting: MAX (bright) / TYP (standard) / MIN (Dark)

22. List of Setting

No.	Name	Description	Display Spec	Upper display	Name	Lower display	Unit	Default Settings
1. UNIT ALL Settings				1	U-AL			
1-1	Electrical systems	Set Electrical systems (Phase category)	LINE	LINE	Single-phase 2-wire	1P2W	-	3P3W
					Single-phase 3-wire	1P3W		
					Three-phase 3-wire	3P3W		
					Three-phase 4-wire	3P4W		
					Single-phase two-wire branched from single-phase three-wire	1P2Z		
					Single-phase 3-wire + single-phase 2-wire	1P3Z		
1-2	Rated Voltage Input	Set the rated voltage value on the secondary side.	VOLT	VOLT	110 V	110	[V]	220
					220 V	220		
1-3	External VT Rating	Set the rated voltage value on the primary side. *In Voltage-less measurement, this set value will be used as the voltage setting value.	VT	VOLT	Range (Numeric input)	110~77000	[V]	220
2-5. Unit Individual Settings				2-5	U-U			
2-1-5-1	Circuit enable/disable setting	Set the enable/disable settings for the circuit.	ACTV	ACTV	OFF	OFF	-	OFF
					ON	ON		
2-2-5-2	Rated Current Input	Set the rated current value for the secondary side.	AMP	AMP	5A	5	[A]	600
					50 A	50		
					100 A	100		
					200 A	200		
					400 A	400		
					600 A	600		
2-3-5-3	External CT rating setting	Set the rated current value for the primary side.	CT	CT	Range (Numeric input)	5~9999	[A]	600
2-4-5-4	Digital Output Terminal Assignment	Use this to assign the Digital output of this circuit to DO1 or DO2.	OUTs	OUT	OFF	OFF		OFF
					OUT1	OUT1		
					OUT2	OUT2		
2-5-5-5	Current Low-cut	Treat currents below the low-cut setting value as zero.	LCUT	LCUT	Range	0.0~9.9%	[%]	0.1
2-6-5-6	Measurement Voltage Setting	Select which line-to-line load of the single-phase 3-wire system to measure.	VSET	VSET	Between 1-N	1-N	-	1-N
					Between 2-N	2-N		
					Between 1-2	1-2		
2-7-5-7	Voltage-less Measurement ON/OFF	Perform power measurement using only current measurement without voltage wiring.	SMPL	SMPL	OFF	OFF	-	OFF
					ON	ON		
2-8-5-8	Virtual Power Factor	Set the value of the virtual Power factor.	PFIN	PFIN	Range (Numeric input)	0.0~100.0	[%]	100.0
2-9-5-9	Conversion Coefficient	Set the coefficient to multiply the Active power (received power) when calculating the conversion value.	RATE	RATE	Range (Numeric input)	0.000~9.999	-	0.555
2-10-5-10	Energy Preset	Change the value of Energy to the specified value.	WSET	1~3	range (Numeric input)	0.000~999,999,999,999	[kWh]	0.000
2-11-5-11	Total Energy Reset (Individual circuit)	Use this to initialize the Total Energy for each circuit.	RST	RST	Normal Execution	DO⇒OK	-	-
2-12-5-12	Quick Wiring Error Diagnosis	Perform a simple diagnosis to check whether the parameters being set match the wiring conditions.	CNCT	Diagnostic results	Diagnostic result display	Diagnostic results	-	-
6. Modbus Communication settings				6	RTU			
6-1	Address	Set the node address in the range of 1~99.	U-NO	U-NO	Range (Numeric input)	0~99	-	0
6-2	Baud rate	Select the Baud rate.	BPS	BPS	4800	4.8K	[bps]	19.2k
					9600	9.6K		
					19200	19.2K		
					38400	38.4K		
6-3	Stop Bits	Select the stop bit.	STOP	STOP	1	1	-	1
					2	2		
6-4	Parity	Select the parity bit.	PRTY	PRTY	None	NONE	-	EVEN
					Odd number	ODD		
					Even number	EVEN		
6-5	Transmission Delay Time	Set the wait time before transmission	WAIT	WAIT	Range (numeric input) 0~99 ms	0~99	[ms]	0

No.	Name	Description	Display Spec.	Upper display	Name	Lower display	Unit	Default Settings		
7. Digital / Pulse Output Settings				7	POUT					
7-1	DO1 Output Operation Selection	Select whether the output operation of DO1 is cumulative pulse output or alarm operation	PO1	PO1	None	OFF	-	OFF		
					Pulse Totalization Output	PULS				
					Alarm action	ALM				
7-2	DO1 Unit Pulse Weight Setting	Set the pulse weight for DO1	PLW1	PLW1	0.001 kWh	0.001	【kW】	0.1		
					0.01 kWh	0.01				
					0.1 kWh	0.1				
					0.5 kWh	0.5				
					1 kWh	1				
					10 kWh	10				
					100 kWh	100				
7-3	DO1 Pulse Output Width Setting	Set the ON-time of the output pulse for DO1	PWD1	PWD1	100 ms	100	【ms】	1000		
					250 ms	250				
					500 ms	500				
					1000 ms	1000				
7-4	DO1 Alarm Circuit Assignment	Assign the alarm operation of DO1 in this circuit to a specific circuit.	ALM1	ALM1	Single-phase 2-wire	Circuit A	A	-	A	
						Circuit B	B			
						Circuit C	C			
						Circuit D	D			
					Single-phase 2-wire	Circuit A	A			
						Circuit C	C			
					Three-phase 4-wire	Circuit A	A			
						Circuit A	A			
					Single-phase 2-wire, two-branch	Circuit B	B			
						Circuit C	C			
						Circuit D	D			
						Single-phase 3-wire + Single-phase 2-wire	Circuit A			A
					Circuit C		C			
					Circuit D		D			
7-5	DO1 Alarm HI/LO Setting	Select the alarm direction for DO1 as either HI or LO.	AHL1	AHL1	HI		HI	-	HI	
					LO	LO				
7-6	DO1 Alarm kW/A setting	Select the alarm criteria for DO1 as either Active power or phase current.	AWA1	AWA1	Single-phase 2-wire	kW	kW	【kW】	kW	
						Current phase 1	A			【A】
					Single-phase 3-wire	kW	kW	【kW】		
						Current phase 1	1			【A】
						Current phase 2	2			
						Current phase 3	N			
					Three-phase 3-wire	kW	kW	【kW】		
						Current phase 1	R			【A】
						Current phase 2	T			
						Current phase 3	S			
					Three-phase 4-wire	kW	kW	【kW】		
						Current phase 1	R			【A】
						Current phase 2	T			
						Current phase 3	S			
						Current phase 4	N			
					Single-phase 2-wire two-branch	kW	kW	【kW】		
Current phase 1	A	【A】								
Single-phase 3-wire + Single-phase 2-wire	kW		kW	【kW】						
	Circuit A Current phase 1		1			【A】				
	Circuit A Current phase 2	2								
	Circuit A Current phase 3	N								
	Circuit C Current phase 1	A								
Circuit D Current phase 1	A									
7-7	DO1 Alarm HI Threshold (Active Power Setting)	Specify the Active power value for DO1 alarm HI criteria.	AW1H	1-2	Range (numeric input) ±9,999,999	Less than 6 MW	±9999,999	【kW】	9999,999	
						Less than 6 M-60 MW	±99999.99			
						Less than 60 M-600 MW	±999999.9			
						600 MW or more	±9999999			
7-8	DO1 Alarm HI Threshold (Phase Current Setting)	Specify the phase current value for DO1 alarm HI criteria.	AA1H	AA1H	Range (numeric input) 0000-9999 A	5-80 A or less	99.99	【A】	999.9	
						81-800 A or less	999.9			
						801-9999 A or less	9999			
7-9	DO1 Alarm LO Threshold (Active Power Setting)	Specify the Active power value for DO1 alarm LO criteria.	AW1L	1-2	Range (numeric input) ±9,999,999	Less than 6 MW	±9999,999	【kW】	-9999,999	
						Less than 6 M-60 MW	±99999.99			
						Less than 60 M-600 MW	±999999.9			
						600 MW or more	±9999999			
7-10	DO1 Alarm LO Threshold (Phase Current Setting)	Specify the phase current value for DO1 alarm LO criteria.	AA1L	AA1L	Range (numeric input) 0000-9999 A	5-80 A or less	99.99	【A】	0.0	
						81-800 A or less	999.9			
						801-9999 A or less	9999			
7-11	DO1 Hysteresis Width (Active Power Setting)	Specify the hysteresis width for alarm reset operation of DO1 in terms of Active power value.	HSW1	1-2	Range (numeric input) 0-9,999,999 kW	Less than 6 MW	±9999,999	【kW】	0.000	
						Less than 6 M-60 MW	±99999.99			
						Less than 60 M-600 MW	±999999.9			
						600 MW or more	±9999999			
7-12	DO1 Hysteresis Width (Phase Current Setting)	Specify the hysteresis width for alarm reset operation of DO1 in terms of phase current value.	HSA1	HSA1	Range (numeric input) 0000-9999 A	5-80 A or less	99.99	【A】	0.0	
						81-800 A or less	999.9			
						801-9999 A or less	9999			

No.	Name	Description	Display Spec.	Upper Display	Name	Lower display		Unit	Default Settings
7-13	DO1 Output OFF Delay	Set the OFF-delay time for the alarm reset operation of DO1	DEY1	DEY1	Range (numeric input) 0.0~99.9s	0.0~99.9		[s]	00.0
7-14	DO2 Output Operation Selection	Select whether the output operation of DO2 is cumulative pulse output or alarm operation	PO2	PO2	Without	OFF		-	OFF
					Pulse Totalization Output	PULS			
					Alarm action	ALM			
7-15	DO2 Unit Pulse Weight Setting	Set the pulse weight for DO2	PLW2	PLW2	0.001 kWh	0.001		[kW]	0.1
					0.01 kWh	0.01			
					0.1 kWh	0.1			
					0.5 kWh	0.5			
					1 kWh	1			
					10 kWh	10			
					100 kWh	100			
7-16	DO2 Pulse Output Width Setting	Set the ON-time of the output pulse for DO2	PWD2	PWD2	100 ms	100		[ms]	1000
					250 ms	250			
					500 ms	500			
					1000 ms	1000			
7-17	DO2 Alarm Circuit Assignment	Assign the alarm operation of DO2 in this circuit to a specific channel	ALM2	ALM2	Single-phase 2-wire	Circuit A	A	-	A
						Circuit B	B		
						Circuit C	C		
						Circuit D	D		
					Single-phase 2-wire	Circuit A	A		
						Circuit C	C		
					Three-phase 4-wire	Circuit A	A		
						Circuit A	A		
					Single-phase 2-wire, two-branch	Circuit B	B		
						Circuit C	C		
						Circuit D	D		
						Circuit A	A		
					Single-phase 3-wire + Single-phase 2-wire	Circuit C	C		
						Circuit D	D		
						Circuit A	A		
						Circuit D	D		
7-18	DO2 Alarm HI/LO Setting	Select the alarm direction of DO2 as either HI or LO	AHL2	AHL2	HI LO	HI LO		-	HI
7-19	DO2 alarm kW/A setting	Select whether the alarm threshold for DO2 is based on Active power or phase current	AWA2	AWA2	Single-phase 2-wire	kW	kW	[kW]	kW
						Current phase 1	A	[A]	
					Single-phase 3-wire	kW	kW	[kW]	
						Current phase 1	1	[A]	
						Current phase 2	2		
						Current phase 3	N		
					Three-phase 3-wire	kW	kW	[kW]	
						Current phase 1	R	[A]	
						Current phase 2	T		
						Current phase 3	S		
					Three-phase 4-wire	kW	kW	[kW]	
						Current phase 1	R	[A]	
						Current phase 2	T		
						Current phase 3	S		
						Current phase 4	N		
					Single-phase 2-wire, two-branch	kW	kW	[kW]	
Current phase 1	A	[A]							
Single-phase 3-wire + Single-phase 2-wire	kW	kW	[kW]						
	Circuit A Current Phase 1	1	[A]						
	Circuit A Current phase 2	2							
	Circuit A: Current phase 3	N							
	Circuit C Current Phase 1	A							
	Circuit D Current Phase 1	A							
7-20	DO2 Alarm HI Threshold (Active Power Setting)	Specify the HI alarm threshold value of DO2 for Active power	AW2H	1~2	Range (numeric input) ±9,999,999	Less than 6 MW	±9999,999	[kW]	9999,999
						Less than 6 M~60 MW	±99999,99		
						Less than 60 M~600 MW	±999999,9		
						600 MW or more	±9999999		
						5~80 A or less	99,99		
7-21	DO2 Alarm HI Threshold (Phase Current Setting)	Specify the HI alarm threshold value of DO2 for phase current	AA2H	AA2H	Range (numeric input) 0000~9999 A	81~800 A or less	999,9	[A]	999,9
						801~9999 A or less	9999		
						Less than 6 MW	±9999,999		
7-22	DO2 Alarm LO Threshold (Active Power Setting)	Specify the LO alarm threshold value of DO2 for Active power	AW2L	1~2	Range (numeric input) ±9,999,999	Less than 6 M~60 MW	±99999,99	[kW]	-9999,999
						Less than 60 M~600 MW	±999999,9		
						600 MW or more	±9999999		
						5~80 A or less	99,99		
7-23	DO2 Alarm LO Threshold (Phase Current Setting)	Specify the LO alarm threshold value of DO2 for phase current	AA2L	AA2L	Range (numeric input) 0000~9999 A	81~800 A or less	999,9	[A]	0.0
						801~9999 A or less	9999		
						Less than 6 MW	±9999,999		
7-24	DO2 Hysteresis Width (Active Power Setting)	Specify the hysteresis width for the alarm reset operation of DO2 using Active power value	HSW2	1~2	Range (numeric input) 0~9,999,999 kW	Less than 6 M~60 MW	±99999,99	[kW]	0.000
						Less than 60 M~600 MW	±999999,9		
						600 MW or more	±9999999		
						Less than 6 MW	±9999,999		

No.	Name	Description	Display Spec	Upper Display	Name	Lower display		Unit	Default Settings
7-25	DO2 Hysteresis Width (Phase Current Setting)	Specify the hysteresis width for DO2 alarm reset operation based on the phase current value	HSA2	HSA2	Range (numeric input) 0000-9999 A	5-80 A or less	99.99	【A】	0.0
						81-800 A or less	999.9		
						801-9999 A or less	9999		
7-26	DO2 Output OFF Delay	Set the OFF delay time for DO2 alarm reset operation	DEY2	DEY2	Range (numeric input) 0.0-99.9s	0.0-99.9		【s】	00.0
7-27	DO1 Simulated Output	Use this when you want to perform a simulated output on DO1	MO-1	MO-1	OFF	OFF		-	OFF
					ON	ON			
7-28	DO2 Simulated Output	Use this when you want to perform a simulated output on DO2	MO-2	MO-2	OFF	OFF		-	OFF
					ON	ON			
7.Digital / Pulse Input Settings				7	PIN				
7-1	DI1 Pulse Totalization Preset	Change the DI1 pulse Totalization to an arbitrary value	PPR1	1-2	Range (numeric input) 0-99,999,999	0-99,999,999		【cnt】	0
7-2	DI1 ON-Time Totalization Preset	Change the DI1 ON-Time Totalization to an arbitrary value	HPR1	1-2	Range (numeric input) 0-5,999,999	0-5,999,999		【min】	0
7-3	DI1 Pulse Totalization Reset	Use this to initialize the DI1 pulse Totalization	PRS1	PR1	Normal Execution	DO⇒OK		-	-
7-4	DI1 ON-Time Totalization Reset	Use this to initialize the DI1 ON-Time Totalization	HRS1	HRS1	Normal Execution	DO⇒OK		-	-
7-5	DI1 Pulse Totalization Coefficient	Set the pulse coefficient for the measured DI1 pulse Totalization.	PIC1	1-2	Range (numeric input) 0.001-100.000	0.001-100.000		-	1.000
7-6	DI1 Pulse Totalization Maximum Value	Change the maximum value of the DI1 pulse Totalization to the specified value.	PMX1	1-2	Range (numeric input) 1-99,999,999	1-99,999,999		【cnt】	99,999,999
7-7	DI2 Pulse Totalization Preset	Change the DI2 pulse Totalization to the specified value	PPR2	1-2	Range (numeric input) 0-99,999,999	0-99,999,999		【cnt】	0
7-8	DI2 ON-Time Totalization Preset	Change the DI2 ON-Time Totalization to the specified value	HPR2	1-2	Range (numeric input) 0-5,999,999	0-5,999,999		【min】	0
7-9	DI2 Pulse Totalization Reset	Use this to initialize the DI2 pulse Totalization	PRS2	PRS2	Normal Execution	DO⇒OK		-	-
7-10	DI2 ON-Time Totalization Reset	Use this to initialize the DI2 ON-Time Totalization	HRS2	HRS2	Normal Execution	DO⇒OK		-	-
7-11	DI2 Pulse Totalization Coefficient	Set the pulse coefficient for the measured DI2 pulse Totalization	PIC2	1-2	Range (numeric input) 0.001-100.000	0.001-100.000		-	1.000
7-12	DI2 Pulse Totalization Maximum Value	Change the maximum value of the DI2 pulse Totalization to the specified value	PMX2	1-2	Range (numeric input) 1-99,999,999	1-99,999,999		【cnt】	99,999,999
7-13	DI1 Simulated Input	Use this when you want to simulate input on DI1	MI-1	MI-1	OFF	OFF		-	OFF
					ON	ON			
7-14	DI2 Simulated Input	Use this when you want to simulate input on DI2	MI-2	MI-2	OFF	OFF		-	OFF
					ON	ON			
8. Other Settings				8	ETC				
8-1	Auto display OFF	Set the time until the automatic display OFF	DISP	DISP	OFF	OFF		【min】	OFF
					1.0 minutes	1.0			
					5.0 minutes	5.0			
					10.0 minutes	10.0			
8-2	Initialize Settings	Execute initialization of settings (Factory default settings)	INIT	INIT	Normal Execution	DO⇒OK		-	-
8-3	Communication Reception test	Execute communication receive test	REC	REC	Normal Execution	Received data		-	-
8-4	Communication Transmission Test	Execute communication transmit test	TEST	TEST	Normal Execution	DO⇒OK		-	-
8-5	Reset Total Energy (All)	Use this to reset Total energy for all circuits	RST	RST	Normal Execution	DO⇒OK		-	-
8-6	Setting Protection	Restrict changes to all parameters (Lock settings)	LOCK	LOCK	OFF	OFF		-	OFF
					ON	ON			
8-7	Brightness adjustment	Set the display brightness	BRIL	BRIL	Bright	MAX		-	TYP
					Standard	TYP			
					Dark	MIN			

Please note that the contents of this document are subject to change without notice for the purpose of product improvement.

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