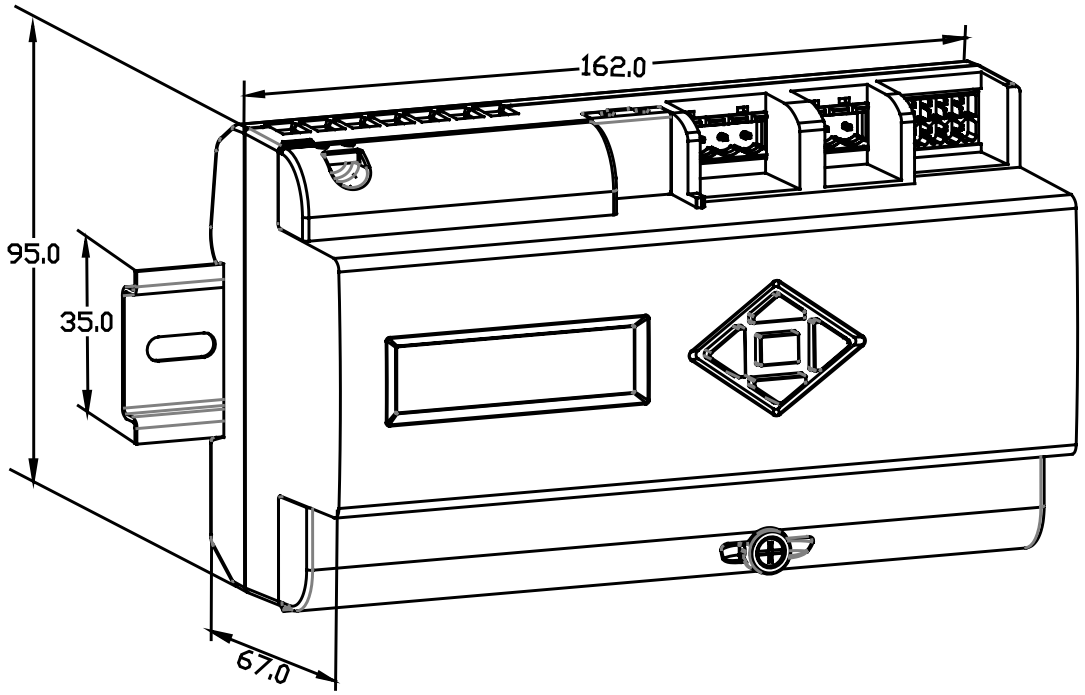
KW1850-P1-D-S
Quick Setup Guide

- Appearance and Dimensions
- Installation Method
- Terminals
- Wiring Diagrams
- Setting Mode
- Specifications

Appearance and Dimensions

Unit：mm

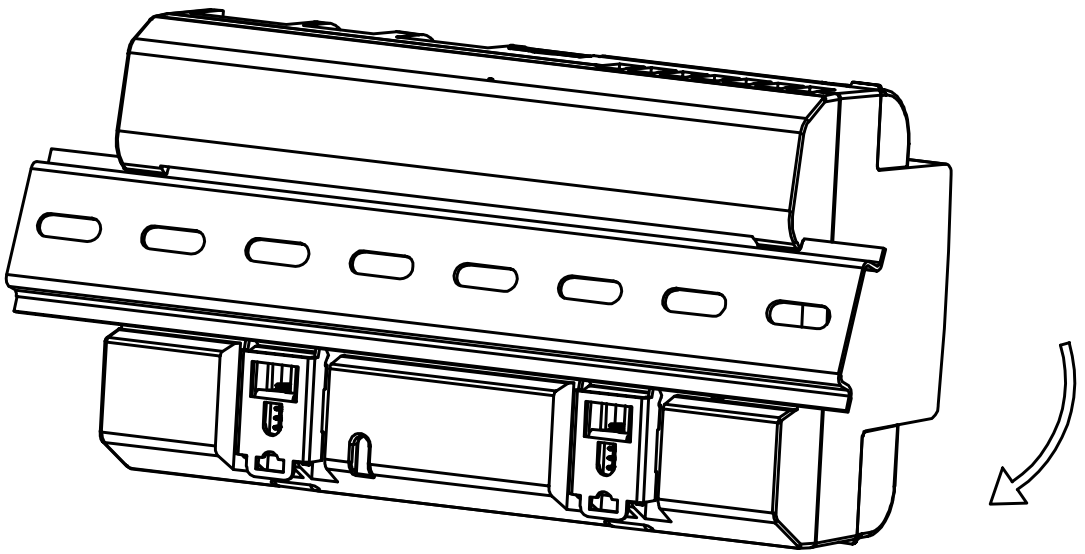


Installation Method

This product is rail mounted and designed for standard 35mm DIN rail.

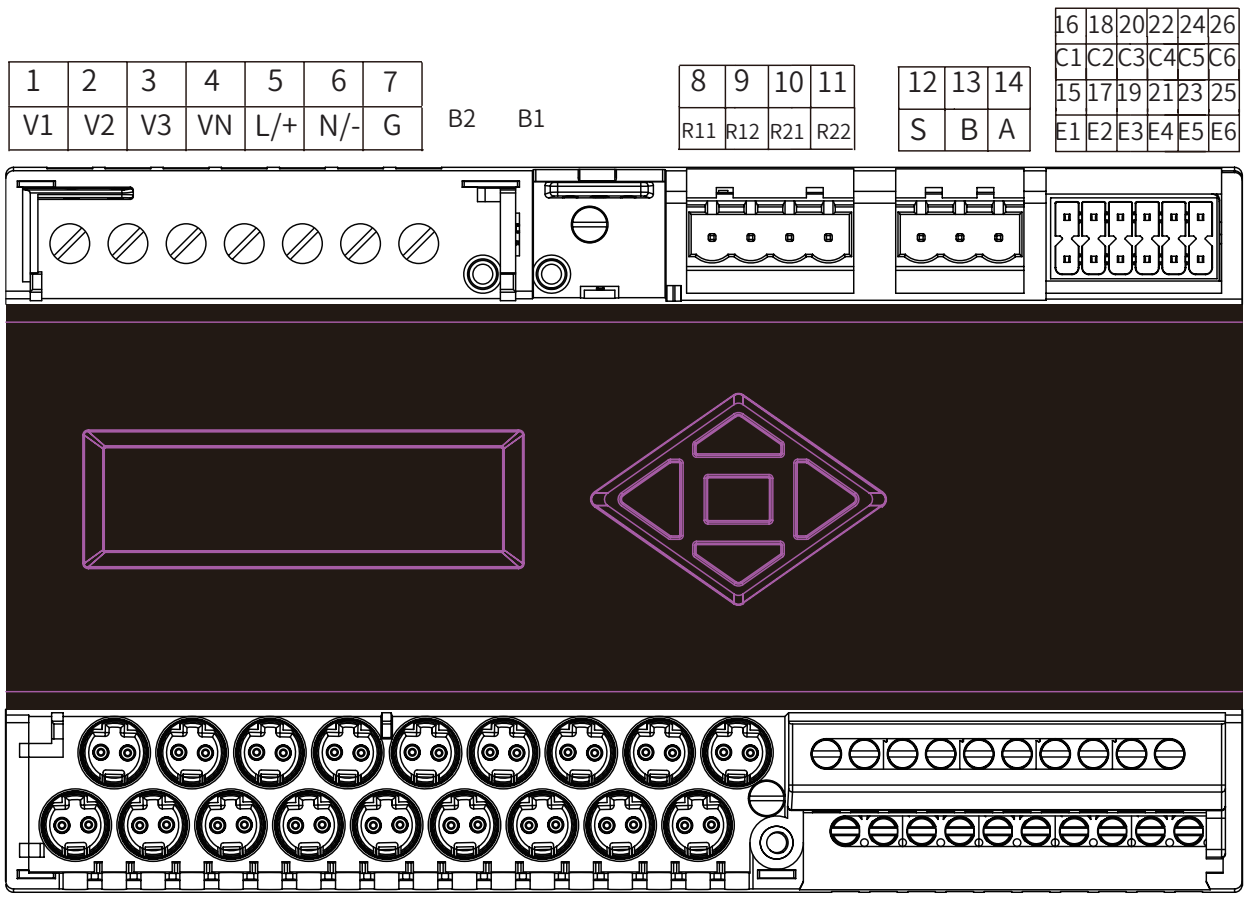
1.Insert the side without clamping groove into the bottom of guide rail, then rotate the housing so that the whole instrument is mounted on the guide rail.

2.Press the metal hook onto the guide rail to complete the installation.



Terminals

Upper row: Voltage Input, Power Supply, Seal Button (B1), Relay Output, RS485, Digital Output。

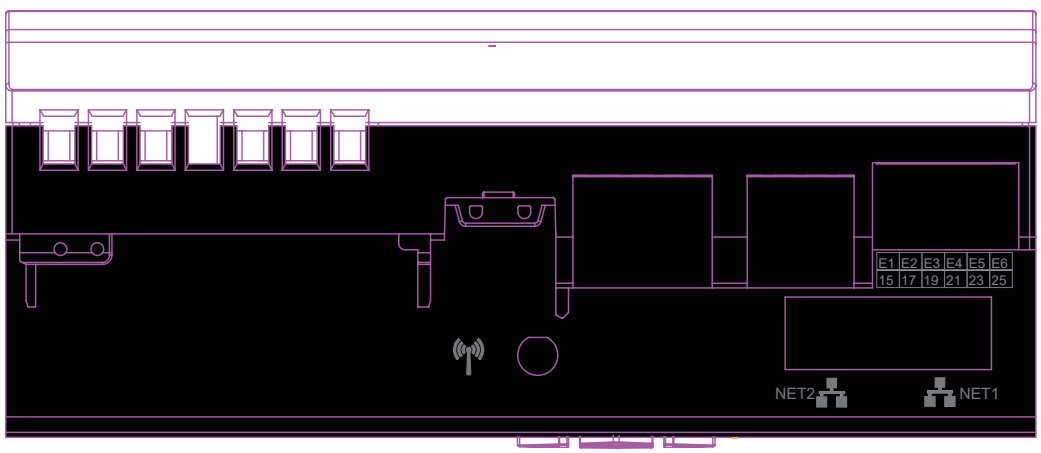


I2	I4	I6	I8	I10	I12	I14I	16	I18
48	50	52	54	56	58	60	62	64

I1	I3	I5	I7	I9	I11	I13	I15I	17
47	49	51	53	55	57	59	61	63

DIC	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI9
27	28	29	30	31	32	33	34	35	36

DIC	DI10	DI11	DI12	DI13	DI14	DI15	DI16	DI17	DI18
37	38	39	40	41	42	43	44	45	46



Terminal name	Function	Terminal type	Terminal aperture	Screw torque
V1、V2、V3、VN	Three phase voltage input port	Plate welding type	2.5mm^2	0.5N·m
L/+、N/-、G	Power input port	Plate welding type	2.5mm^2	0.5N·m
R11、R12、R21、R22	2-channel relay output port	Plug-in type	2.5mm^2	0.4N·m
S、B、A	RS485 communication port	Plug-in type	2.5mm^2	0.4N·m
E1、C1、E2、C2、E3、C3、E4、C4、E5、C5、E6、C6	6-channel pulse output port	Plug-in type	1.5mm^2	
DIC、DIC、DI1、DI2、DI3、DI4、DI5、DI6、DI7、DI8、DI9、DI10、DI11、DI12、DI13、DI14、DI15、DI16、DI17、DI18	18-channel digital output port	Plate welding type	2.5mm^2	0.5N·m
I1、I2、I3、I4、I5、I6、I7、I8、I9、I10、I11、I12、I13、I14、I15、I16、I17、I18	18-channel current input ports	Plug-in type	Self contained plug	

Note:

1.The current input is compatible with current transformers fitted with a Snapon connector and shielded twisted pair lead wire.

2.It is recommended to use 1 - 1.5mm^2 copper conductor for Relay Output and

Digital Output terminals.

3.For the RS485 terminal, high-quality shielded twisted pair cable is very important: 22AWG (0.6mm^2) or lower is recommended.

SnapOn Connector Heads

SnapOn CT Connector Kit (SO-SP1): QTY 20; Each SnapOn CT connector is pre-connected to two shorting connectors. One SnapOn connector kit is included with the KW1850 meter. Polarity is noted in the table below.

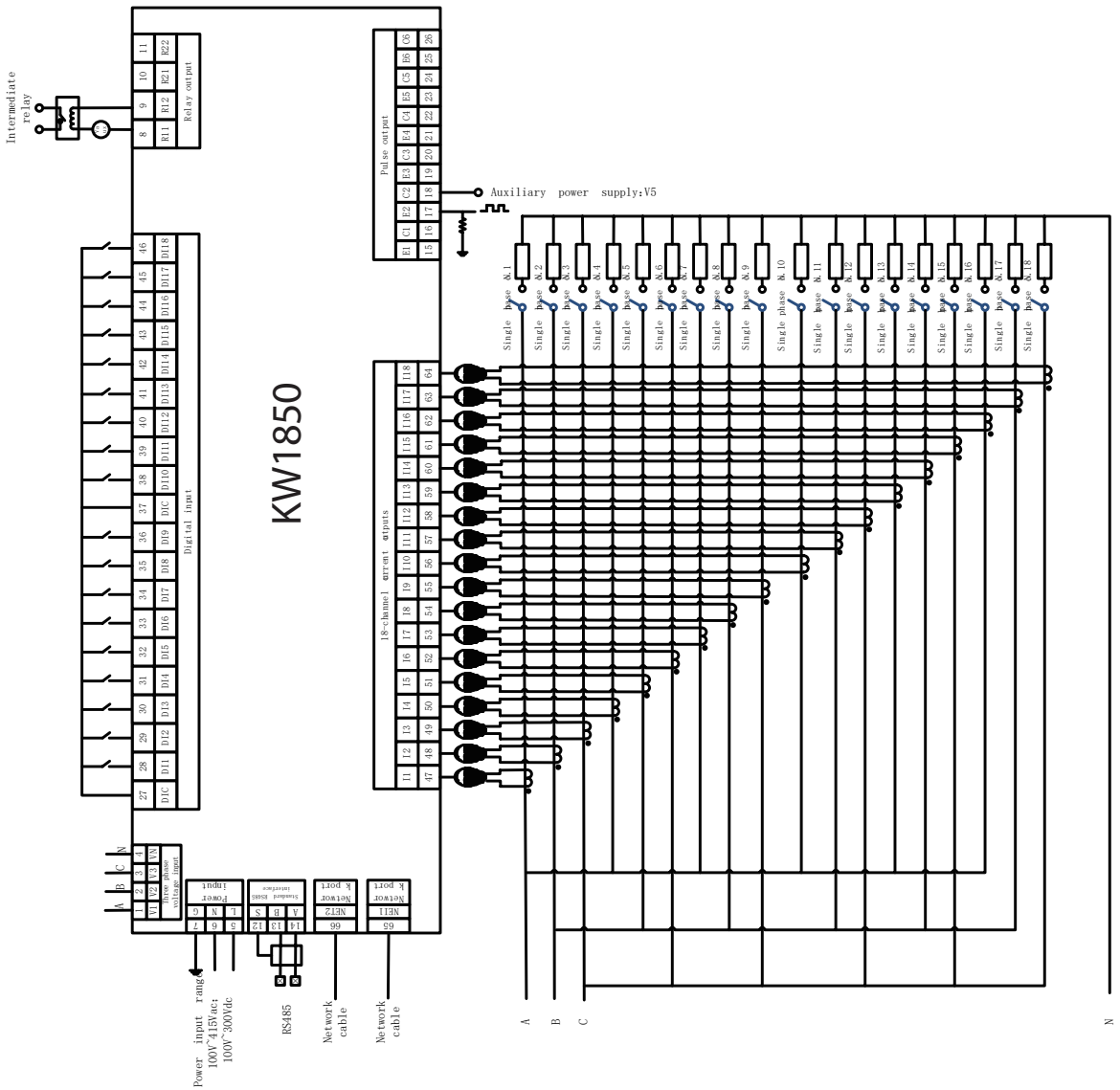
SnapOn Connector Polarity	
North America	White lead is positive. Black lead is negative.
International	Red lead is positive. White lead is negative.

Current Transformer lead wires are directly connected to the SnapOn shorting connectors. The connector is compatible with split core, solid core, and Rogowski CTs or 333mV secondary rated option.

Wiring Diagrams

The KW1850 can be used to measure single-phase electrical services, three-phase electrical services, or a combination of both single and three-phase services (hybrid) simultaneously. The following diagrams describe the wiring connections for each service type.

Single-Phase Wiring Diagram (1LN):

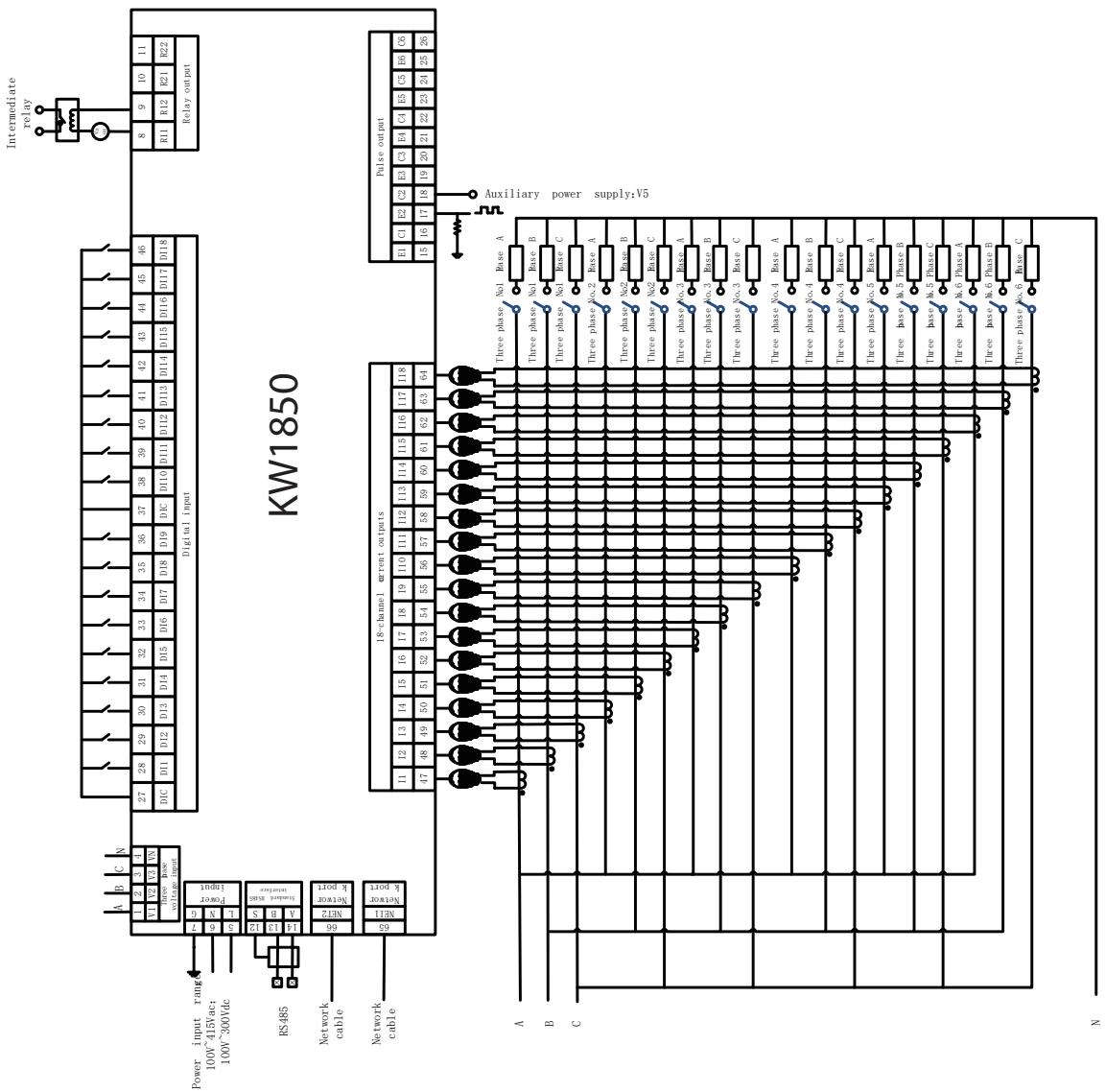


For single-phase connection, the corresponding current relationship is shown in the following table:

Table: Single Phase (1LN):

User Channel	Phase A	User Channel	Phase B	User Channel	Phase C
1	I1	2	I2	3	I3
4	I4	5	I5	6	I6
7	I7	8	I8	9	I9
10	I10	11	I11	12	I12
13	I13	14	I14	15	I15
16	I16	17	I17	18	I18

Three-Phase Wiring Diagram (3LN):

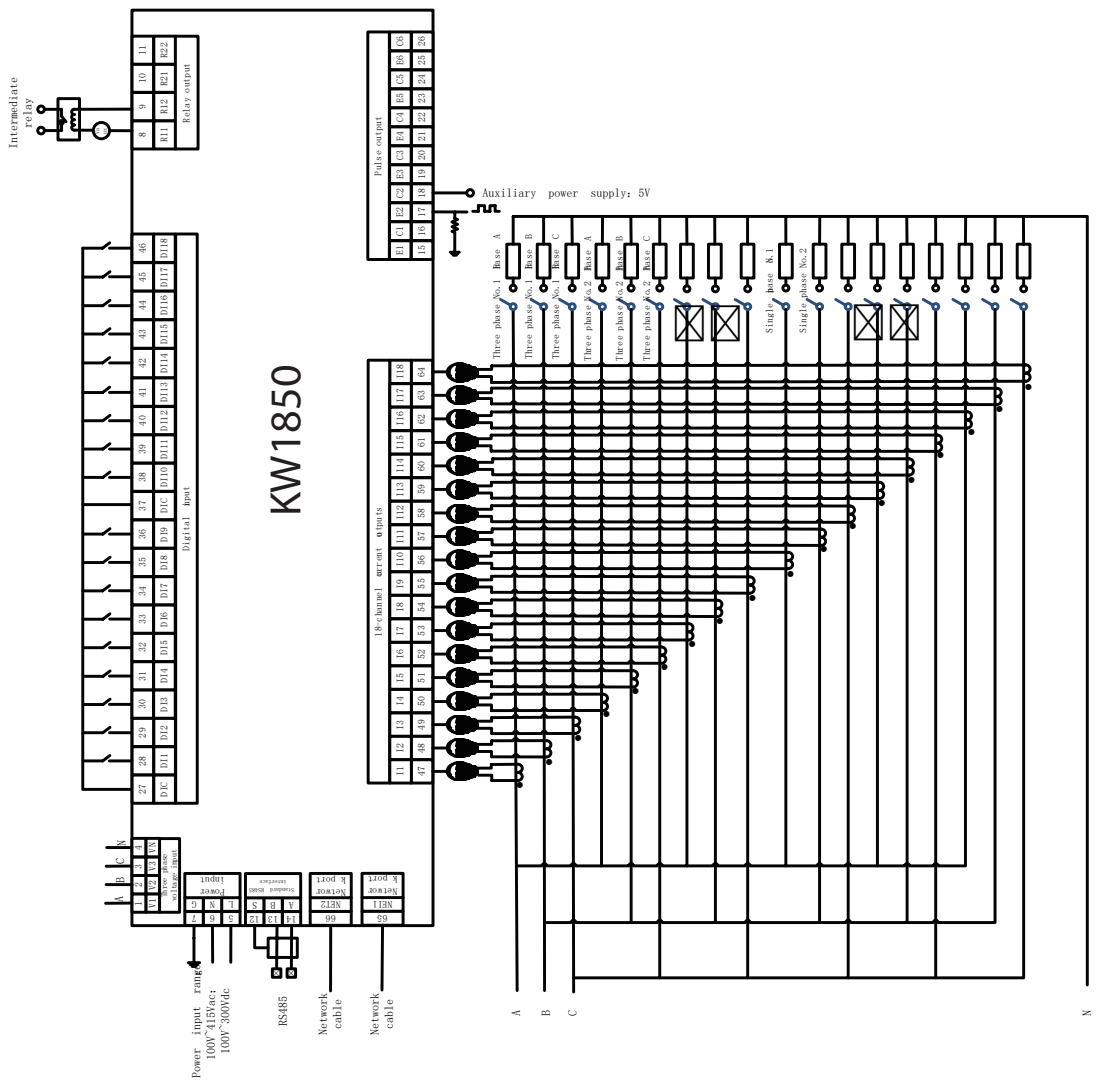


For three-phase connection, the corresponding relationship of current is shown in the following table:

Table: 3-Phase 4-Wire (3LN):

	Three Phase Circuit 1	Three Phase Circuit 2	Three Phase Circuit 3	Three Phase Circuit 4	Three Phase Circuit 5	Three Phase Circuit 6
Phase C	I3	I6	I9	I12	I15	I18
Phase B	I2	I5	I8	I11	I14	I17
Phase A	I1	I4	I7	I10	I13	I16

Single and Three-Phase Hybrid Wiring Diagram:



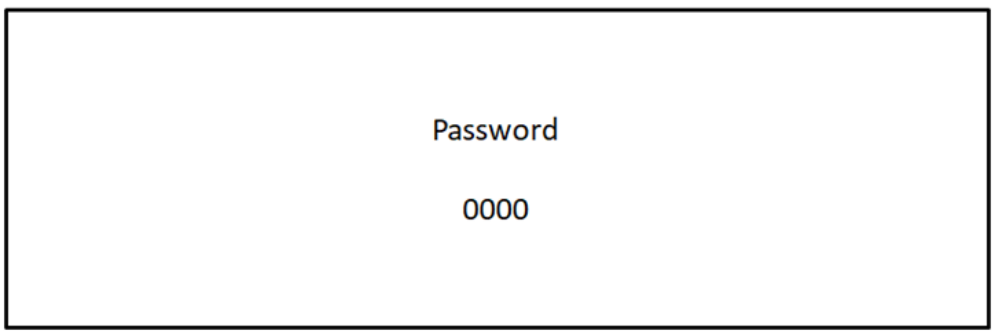
When wiring the meter for single and three-phase hybrid services, three-phase user channels (i.e., metering points) must be connected first followed by single-phase user channels. When there are three-phase user channels, single-phase user channels must be connected from the 3a+1 channel. The corresponding current relationship is shown in the table below:

	Phase A		Phase B		Phase C	
The first three-phase user	I1		I2		I3	
……	……		……		……	
	The first single-phase user	I_{3a+1}	The second single-phase user	I_{3a+2}	The third single-phase user	I_{3a+3}
	……	……	……	……	……	……

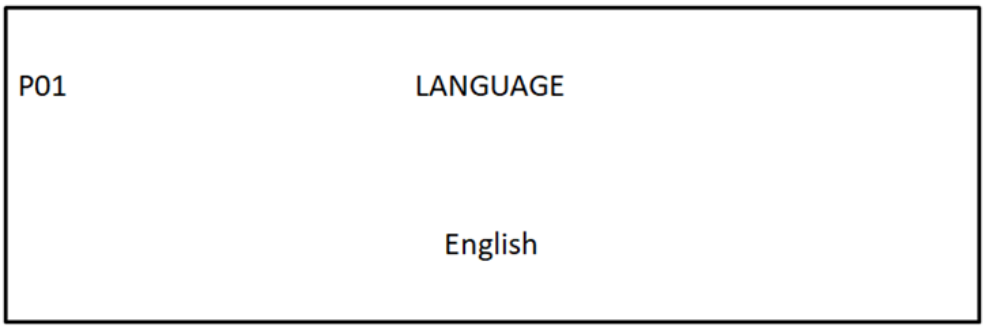
Setting Mode

On the first page of the main menu on the LCD, press the left and right function keys to select the "Setting" mode, then press the middle “OK” key to display each parameter setting.

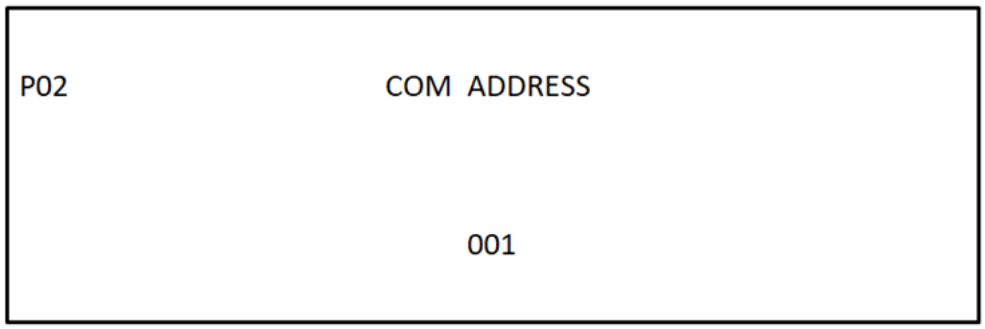
First, enter the correct password to access the instrument. The default password is 0000.



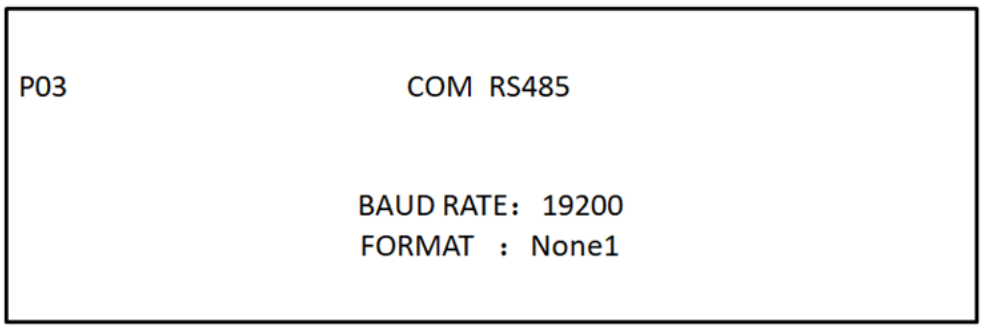
Enter the language settings. The factory default English.



Enter the instrument address setting (device address). The factory default 001.

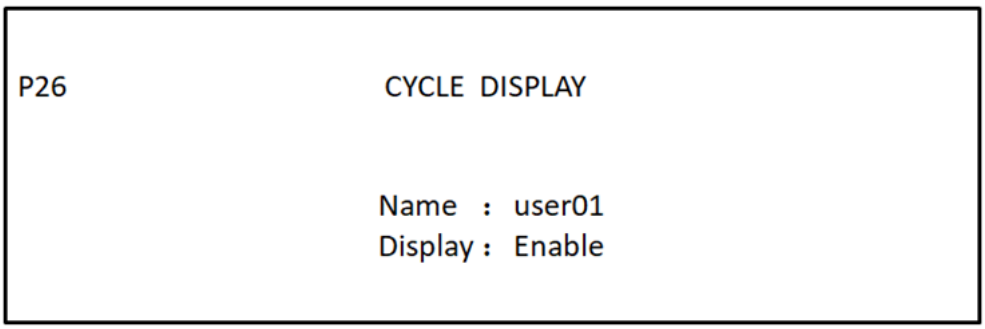


Enter the RS485 communication baud rate and check the parity and stop bit settings. The factory default is 19200, no parity, and 1 stop bit.

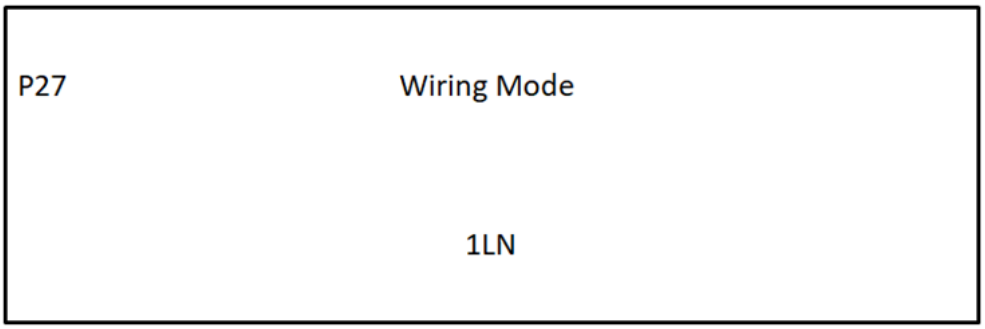


After the above parameters are set, the Wiring Mode should be set according to the type of electrical service on which the meter is installed: single-phase service, three-phase service, or single/three-phase hybrid service.

When measuring a single-phase service:
Configure the number of enabled user channels in the cyclic display interface and disable the unused channels so that they no longer display.



The wiring mode should be set as single-phase output (1LN).



Channel Configuration Settings for Single Phase Systems

First channel:

1.The first single-phase username should be set to “user01”

2.The current transformer should be connected to I1 of the instrument

3.The corresponding channel should be set to 01

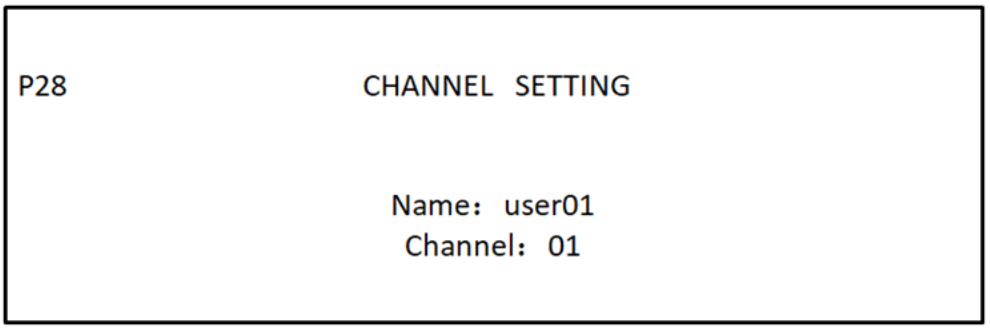
Repeat for the second channel:

1.The second single-phase username should be set to “user02”

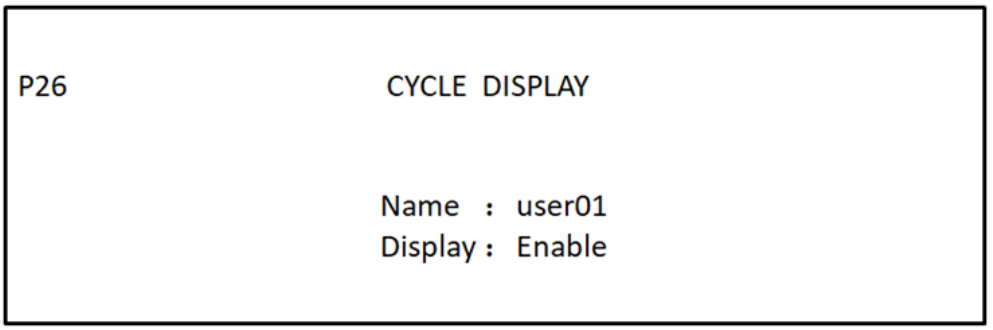
2.The current transformer should be connected to I2 of the instrument

3.The corresponding channel should be set to 02

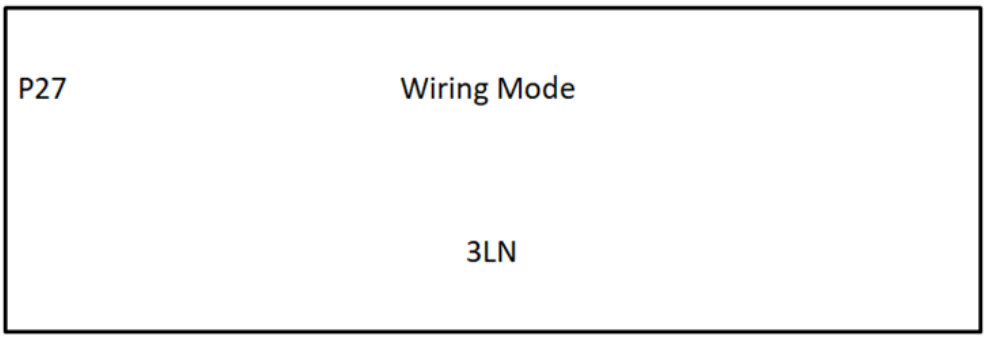
The configuration process follows the same pattern for all remaining channels. Repeat the process until the configuration is complete.



When measuring a three-phase service:
Configure the number of enabled user channels, or metering points, in the cyclic display interface and disable the unused channels so that they no longer display.



The wiring mode should be set as three-phase four-wire output (3LN).



Channel Configuration Settings for Three Phase Systems
First three-phase circuit:
1.The first three-phase username should be set as “user01”

2.The current transformers should be connected to I1 (phase A), I2 (phase B) and I3 (phase C) of the instrument

3.The corresponding channel should be set to 19

Repeat for the second three-phase circuit:

1.The second three-phase username should be set to "user02”

2.the current transformers should be connected to I4 (phase A), I5 (phase B) and I6 (phase C) of the instrument

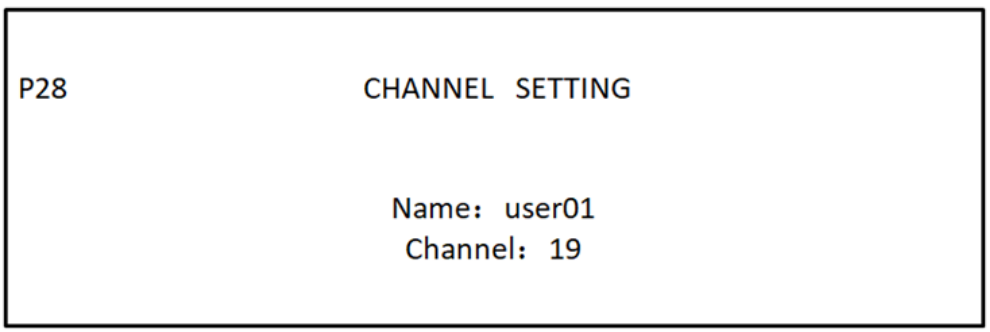
3.The corresponding channel should be set to 20.

Complete this process until reaching the final circuit:

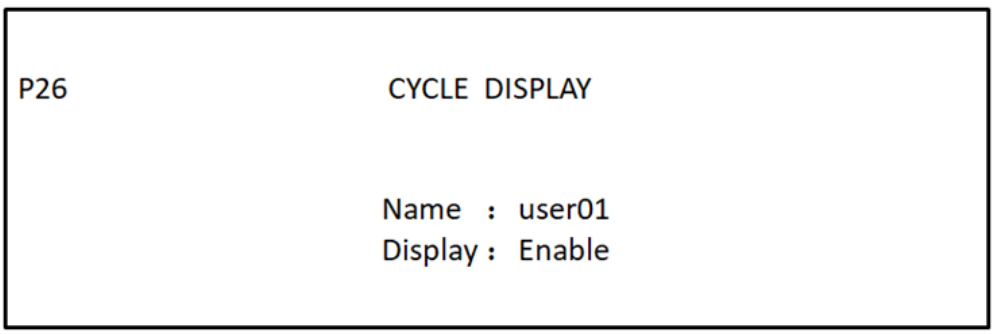
1.The sixth three-phase username should be set as "user6”

2.The current transformers should be connected to I16 (phase A), I17 (phase B), I18 (phase C) of the instrument

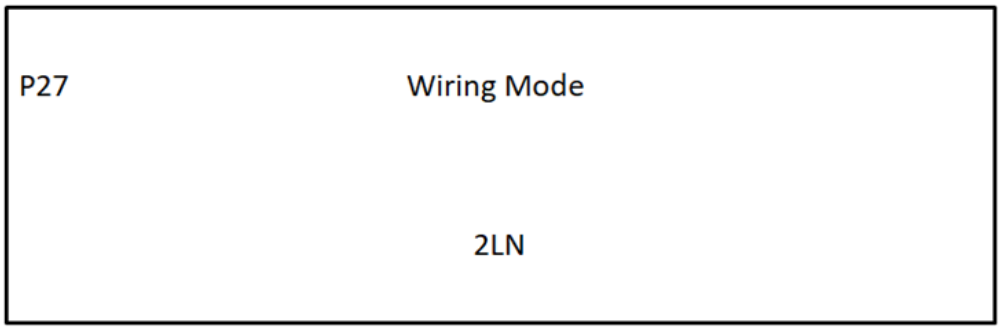
3.The corresponding channel should be set to 24



When measuring a combination of single and three-phase (hybrid) services:
Configure the number of enabled user channels in the cyclic display interface and disable the unused channels so that they no longer display.



The wiring mode should be set as three-phase four-wire output (2LN).



Channel Configuration Settings for Single and Three-Phase Hybrid Systems

1.The first three-phase username should be set as "user01”

2.The current transformers should be connected to I1 (phase A), I2 (phase B), and I3 (phase C)

3.The corresponding channel should be set to I9

Repeat for the second circuit:

1.The second three-phase username should be set as "user02”

2.The current transformers should be connected to I4 (phase A), I5 (phase B), and I6 (phase C)

3.The corresponding channel should be set to 20

Repeat this process for the remaining channels. When there are three-phase users:

1.The first single-phase user should be set as user $_{(a+1)}$

2.The current should be connected to the $I_{(3a+1)}$ port of the instrument

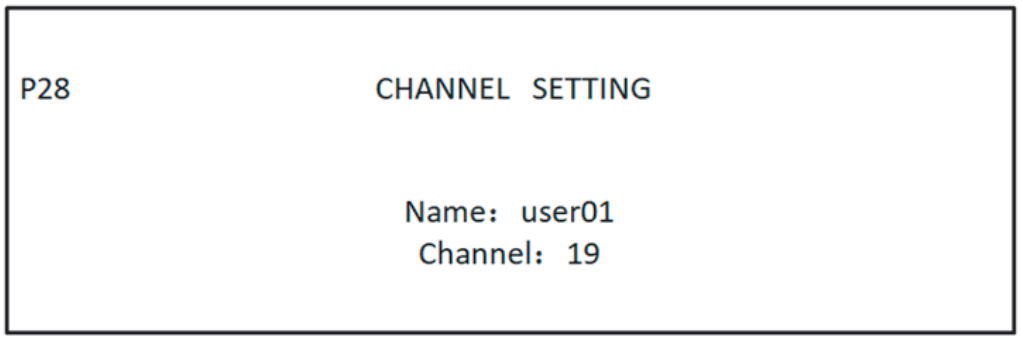
3.The corresponding channel should be set as 3a+1

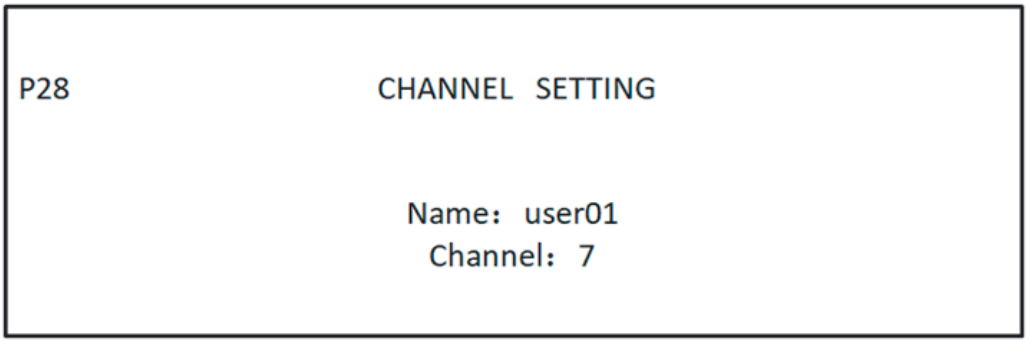
Repeat for remaining channels:

1.The second single-phase user should be set as user $_{(a+2)}$

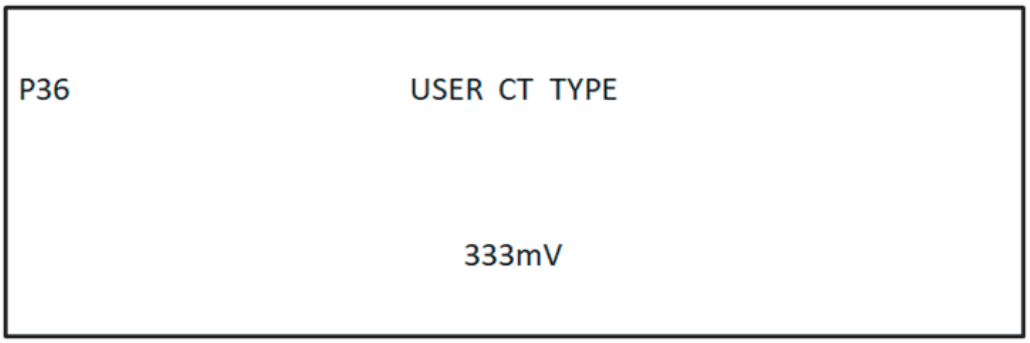
2.The current should be connected to $I_{(3a+2)}$ of the instrument

3.The corresponding channel should be set to 3a+2





Next, configure the current transformer settings. Select the type of CT based on the secondary output signal of the CTs being used. The meter is compatible with 333mV and Rogowski coil (RCT) current transformers. By default, it is set to 333mV.



Specifications

Voltage Input	
Nominal Full Scale	400Vac L-N / 690Va L-L
Withstand	1500Vac continuous, 2500Vac, 50/60Hz 1 minute
Input Impedance	2MΩ
Metering Frequency	45Hz-65Hz
Burden	≤0.3VA

Current Input		
Connection Type	333mV CT	Rogowski Coil
Current Range	3mV-333mV	0.5mV-120mV

SnapOn Connector Polarity	
North America	White lead is positive. Black lead is negative.
International	Red lead is positive. White lead is negative.

Voltage Input	
Voltage Range	100-415Vac, 50/60Hz, 100-300Vdc
Power Waste	≤5W or 10VA

Digital Input	
Input Style	Dry Node
Input Current (MAX)	2mA
Pulse Frequency (MAX)	100Hz, 50% Duty Cycle
SOE Resolution	2ms

Electric Pulse Output (DO)	
External Circuit Voltage	5-30Vdc
Output Current (MAX)	5-50mA
Pulse Width (High)	20-100ms, Programmable
Pulse Constant	1-60000imp/kWh, Programmable

Relay Output (RO)	
Contact Type	Form A, Mechanical Contact
Output Type	Level or Pulse
Rated Voltage	250Vac-30Vdc
Rated Current	3A
Set Time	10ms (MAX)
Contact Resistance	100Ω (MAX)
Isolation Voltage	AC 4000V, 50/60Hz, 1 min
Mechanical Life	More than 5 million times

RS485 Communication	
Communication Interface Rate	1200-115200bps
Communication Protocol	Modbus® TCP, SNMP, SNTP

Ethernet/WiFi (WEB2 Module is Required)	
Communication Protocol	Modbus® TCP, SNMP, SNTP

Operating Environment	
Operating Temperature	-25°C - 70°C
Storage Temperature	-40°C-85°C
Relative Humidity	5%-95% non-frosting
Altitude	2000m

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