SMARTconnect X835

Smart Power Analyzer

- Measures kWh, kVArh, kW, kVAr, kVA, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Total harmonic distortion of voltage and current
- RS485 Modbus communication
- 2 Pulse outputs
- CT and PT operated
- Plug-in solution saves 80% labor
- Easy “clip-in”panel mounting
- Self powered, no need auxiliary supply

USER MANUAL V3.4

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Application

SMARTconnect X835 is an economic solution three phase intelligent power analyzer. It used not only in the electricity transmission and power distribution system, but also in the power consumption measurement and analysis in low and medium voltage intelligent power grid.

This document provides operating, maintenance and installation instructions for SMARTconenct X835. The unit measures and displays the characteristics of single phase two wire, three phase three wire and three phase four wire supplies, including voltage, frequency, current, power, active and reactive energy, imported and exported energy. Energy is measured in terms of kWh, kVArh. Maximum demand current can be measured over preset periods of up to 60minutes. The requisite current input(s) are obtained via current transformers (CT).

The SMARTconenct X835 can be configured to work with a wide range of CTs, giving the unit a wide range of operation. Built-in interfaces provide pulse and RS485 Modbus RTU outputs.

PART 1 Specification

Input

Norminal input voltage	50-276V AC(L-N) 87-480V AC(L-L)
Max.short duration input voltage	2x nominal voltage for 0.5 second
Nominal input voltage burden	< 0.2VA per phase
Nominal input current	1A/ 5A
Nom. input current burden	< 0.1VA
Max. continuous input overload current	120% of nominal
Max. short duration input current	20x nominal current for 0.5 second
Starting current	0.2% Ib
Operating range	Self powered(from any of the three phases)
Supply burden	<2W/ 10VA

Measured Range

Voltage(V)	50-276V AC(L-N) 87-480V AC(L-L)
Current(A)	5-120% of nominal
Frequency(Hz)	45- 66 Hz
Power(W, VAr, VA)	5-120% of nominal (bi-directional)
Energy	8 digits, up to 9999999.9kWh
Power factor	4 quadrants
THD	0-40% up to 63rd harmonic

Accuracy

Voltage(V)	0.5% of range maximum
Current(A)	0.5% of range maximum
Frequency(Hz)	0.2% of mid-frequency
Power factor(PF)	1% of unity
Active power(W)	1% of range maximum
Reactive power(VAr)	2% of range maximum
Apparent power(VA)	1% of range maximum
Active energy(kWh)	Class 1 IEC62053-21
Reactive energy(KVArh)	Class 2 IEC62053-23
THD	2% to 63rd harmonic

Environment

Operating temperature	-25℃ to +55℃
Storage and transportation temperature	-40℃ to +70℃
Relative humidity	0 to 95%, non-condensing
Altitude	up to 2000m
Warm up time	3s
Installation category	CAT III
Mechanical environment	M1
Electromagnetic environment	E2
Ingress protection	IP51(Indoor)
Degree of pollution	2

Output

Pulse output

The meter provides two pulse outputs. Both pulse outputs are passive type.

Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total/ import/ export kWh or kVArh.

The pulse constant can be set to generate 1 pulse per: 0.01/ 0.1/ 1/ 10/ 100/ 1000 kWh/kVArh.

Pulse width: 200/ 100/ 60ms

Pulse output 2 is non-configurable. It is fixed to total kWh. The constant is 3200imp/kWh.

RS485 output for Modbus RTU

The meter provides a RS485 port for remote communication. Modbus RTU is the protocol applied. For Modbus RTU, the following RS485 communication parameters can be configured by the Modbus command.

Baud rate: 2400, 4800, 9600, 19200, 38400 bps. Default: 9600 bps

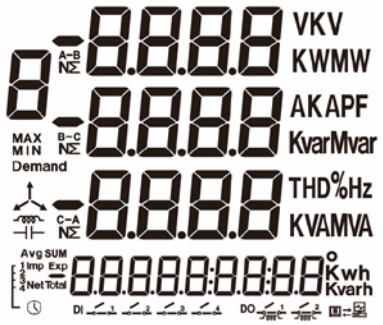
Parity: NONE/ EVEN/ ODD

Stop bits: 1 or 2

Modbus Address: 1 to 247

PART 2 Operation

Start-up Screens

	The first screen lights all display segments and can be used as a display check.
	The second screen indicates the firmware installed in the unit and its build number.
	Next the unit performs a self-test and indicates if passes the test.

After a short delay, the screen will display active energy measurements.

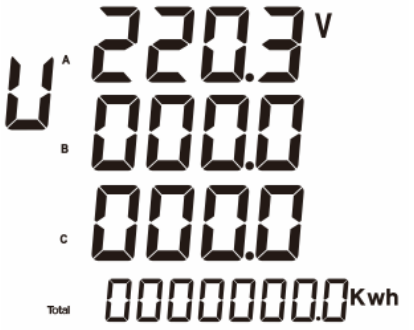
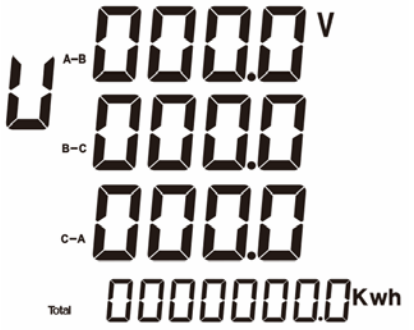
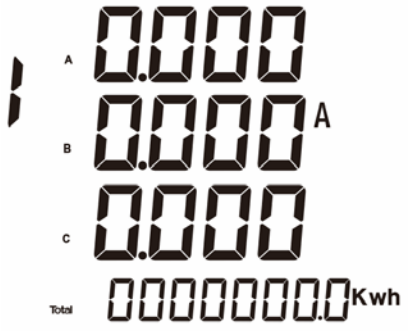
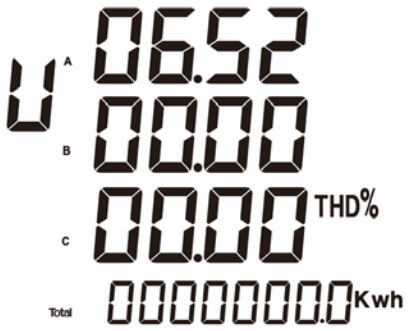
Measurements

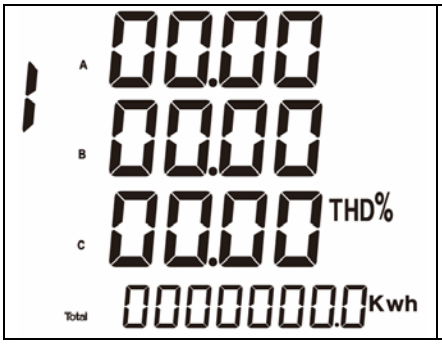
The buttons operate as follows:

	Selects the voltage and current display screens. In set-up mode, this is the “left” or “back” button.
	Select the frequency and power factor screens. In set-up mode, this is the “up” button.
	Select the power screens. In set-up mode, this is the “down” button.
	Select the energy display screens. In set-up mode, this is the “enter” or “right” button.

1. Voltage and current

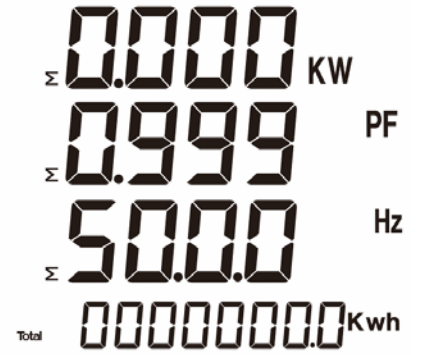
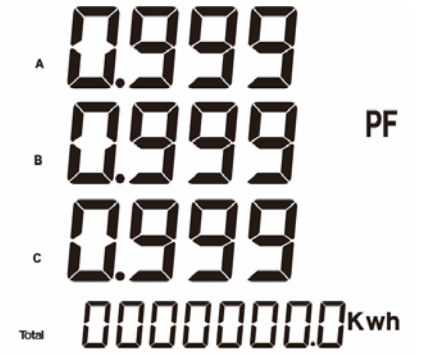
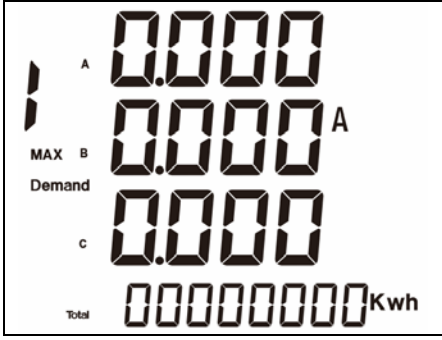
Each successive pressing of the UI/ESC button selects a new range:

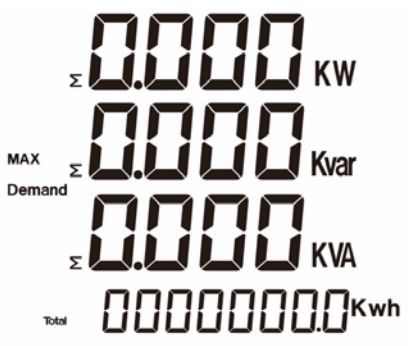
	Phase to neutral voltages
	Phase to phase voltages
	Current of each phase
	Phase to neutral voltage THD%

	Current THD% for each phase

2. Frequency, power factor and demand

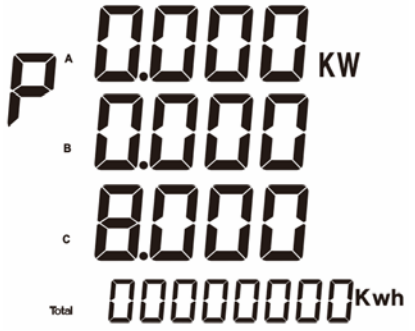
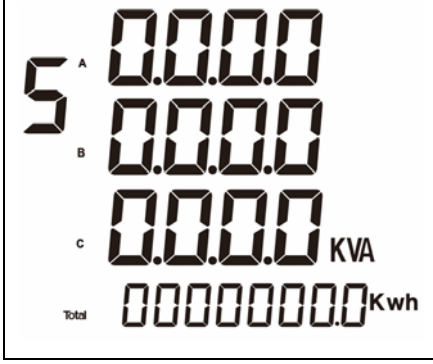
Each successive pressing of the M ▲ button selects a new range:

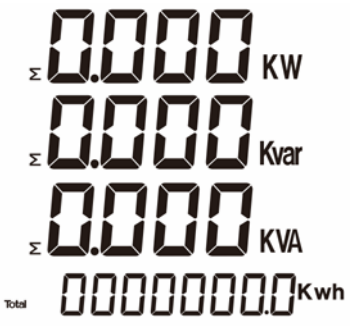
	Total kW Power factor (total) Frequency
	Power factor of each phase
	Max. Current demand

	Max. Power demand

3. Power

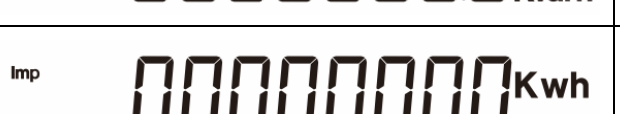
Each successive pressing of the P button select a new range:

	Instantaneous active power (kW)
	Instantaneous reactive power (kVAr)
	Instantaneous apparent power (kVA)

	Total kW, kVAr, kVA

4. Energy measurements

Each successive pressing of the  button selects a new range:

	Total active energy in kWh
	Total reactive energy in kVArh
	Imported active energy in kWh
	Exported active energy in kWh
	Imported reactive energy in kVArh
	Exported reactive energy in kVArh

Set Up

Long press button  to enter the set-up interface.

The default password is 1000. If the input is wrong, the LCD displays “PASS Err”.

Press the button UI ESC to exit set-up interface.

Set-up Mode

1. Modbus address

	The default address is 001. Press E to activate the modification.
	Use M and P buttons to set the address with the range 001~247, and press the button E for confirmation.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

2. Baud rate

	From the set-up menu, use M and P buttons to select the baud rate option. The default is 9600bps.
	Press E to enter the selection routine. The baud rate setting will flash. Use M and P buttons to choose baud rate 2.4k. 4.8k, 9.6k, 19.2k, 38.4k.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

3. Parity

	From the set-up menu, use M and P buttons to select the parity option(ODD/ EVEN/ NONE). Default is NONE.

	Press E to enter the selection routine. The current setting will flash. Use M and P buttons to choose parity (EVEN/ ODD/ NONE).
Pressing E to confirm the setting and press UI ESC to return to the main set-up menu.	

4. Stop bits

	From the set-up menu, use M and P buttons to select the stop bit option (1/ 2). Default it 1.
	Press E to enter the selection routine. The current setting will flash. Use M and P buttons to choose stop bit (1/ 2). Please note stop bits can only be set 2 when parity is NONE.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

5. CT

	From the set-up menu, use M and P buttons to select the CT2 option(5A/ 1A). The screen will show the current CT secondary current value. Default is 5.
	Press E to enter the CT secondary current selection routine (5A/ 1A).
	Press E to enter the CT rate set-up interface. The range is from 0001~2000. Default is 0001.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

6. PT

	From the set-up menu, use M and P buttons to select the PT option. The screen will show the voltage secondary PT voltage value. The range is from 100~500. Default is 400.

	Press E to enter the PT rate set-up interface. The range is from 0001~2000. Default is 0001.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

7. Pulse output

This option allows you to configure the pulse output. The output can be set to provide a pulse for a defined amount of energy active or reactive.

	From the set-up menu, use M and P buttons to select the pulse output option.
	Press E to enter the selection routine. The unit symbol will flash. Use M and P buttons to choose kWh or kVArh.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

8. Pulse constant

Use this to set the energy represented by each pulse. Rate can be set to 1 pulse per 0.01/ 0.1/ 1/ 10/ 100/ 1000 kWh/kVArh.

	From the set-up menu, use M and P buttons to select the pulse rate option.
	Press E to enter the selection routine. The current setting will flash. Use M and P buttons to choose pulse rate. **1 pulse = 0.01/ 0.1/ 1/ 10/ 100/ 1000 kWh/ kVArh** 0.01/ 0.1/ 1/ 10/ 100/ 1000 kWh/ kVArh per pulse.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

9. Pulse duration

	From the set-up menu, use M and P buttons to select the pulse width option.

	Press E to enter the selection routine. The current setting will flash. Use M and P buttons to choose pulse width(200/ 100/ 60ms, the default set-up is 200ms).
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

10. DIT(Demand integration time)

This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement. The options are: 0(off), 5, 8, 10, 15, 20, 30, 60 minutes.

	From the set-up menu, use M and P buttons to select the dit option. The screen will show the currently selected integration time. Default is 60 minutes.
	Press E to enter the selection routine. The current time interval will flash. Use M and P buttons to select the time required.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

11. Backlit set-up

The meter provides a function to set the white backlit lasting time.

	The backlit lasting time is settable. Default lasting time is 60minutes. For example, if it's set as 5, the backlit will be off in 5minutes from the last time operation on the meter. Notes: If it's set as 0, the backlit will always be on.
	Press E to enter the selection routine. The current time interval will flash. The options can be: 0/ 5/ 10/ 30/ 60/ 120minutes
Use M and P buttons to select the time required. Then press E to confirm the set-up.	

12. Supply system

Use this section to set the type of power supply being monitored.

	From the set-up menu, use M and P buttons to select the system option. The screen will show the currently selected power supply.

	Press E to enter the selection routine. The current selection will flash. Use M and P buttons to select the required system option: 3P4W, 3P3W or 1P2W.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

13. Clear kWh

	From the set-up menu, use M and P buttons to select the reset option.
	Press E to enter the selection routine. The yes will flash.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

14. Clear kVArh

	From the set-up menu, use M and P buttons to select the reset option.

	Press E to enter the selection routine. The yes will flash.
Pressing E to confirm the setting and pressing UI ESC to return to the main set-up menu.	

15. Clear Max demand

	From the set-up menu, use M and P buttons to select the reset option.
	Press E to enter the selection routine. The yes will flash.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

16. Change password

	Use the M and P to choose the change password option.

	Press the E to enter the change password routine. The new password screen will appear with the first digit flashing.
	Use M and P to set the first digit and press E to confirm your selection. The next digit will flash.
	Use M and P to set the second digit and press E to confirm your selection. The next digit will flash.
	Use M and P to set the third digit and press E to confirm your selection. The next digit will flash. Use M and P to set the forth digit and press E to confirm your selection.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

17. Auto display in turns

	From the set-up menu, use M and P buttons to select page. Press the button E to activate the modification on the time. Options: 001-255 seconds Default is 5 seconds.
	Use the M and P to set the auto display interval time.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

18. Reverse connected current inputs correction setting

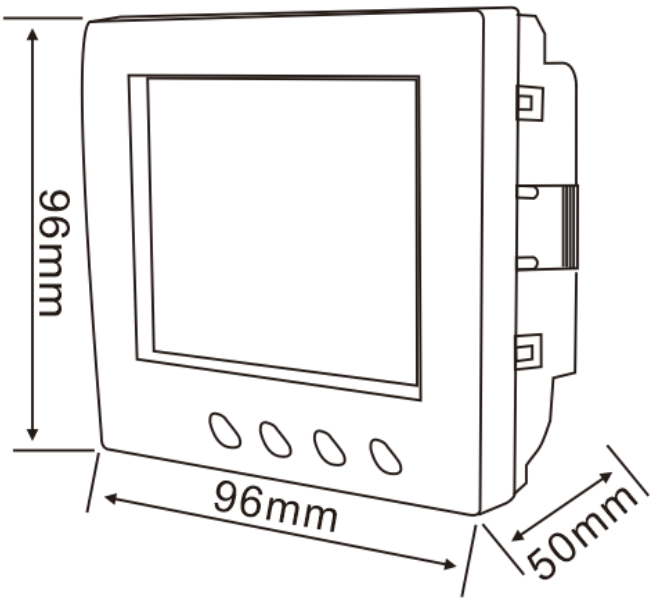
	From the set-up menu, use M and P buttons to select page.
	Press E to enter Phase A , the default is FRD (forward).

	Use M and P buttons to Phase B or C setting pages.
Press button E to confirm the setting and press UI ESC to return to the main set-up menu.	

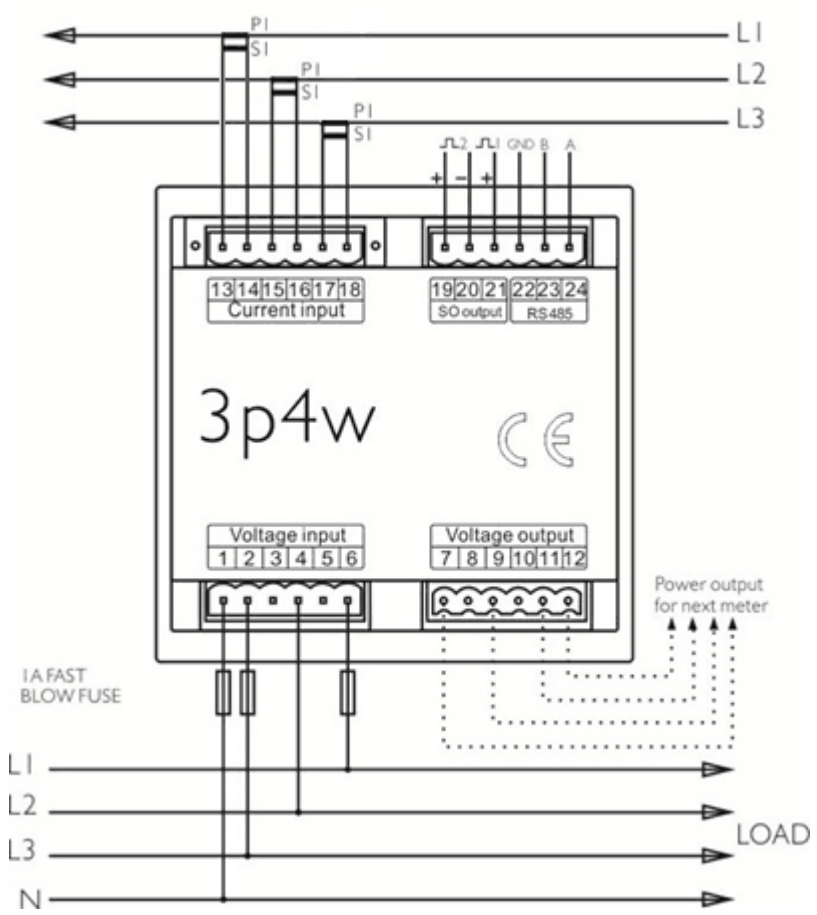
19. **How to operate if phase A is reversely connected**

	Press E to enter Phase A.
	Press E to enter the selection routine. The FRD will flash. Use P button to change FRD to REV.
Press E to confirm the setting and press UI ESC to return to the main set-up menu.	

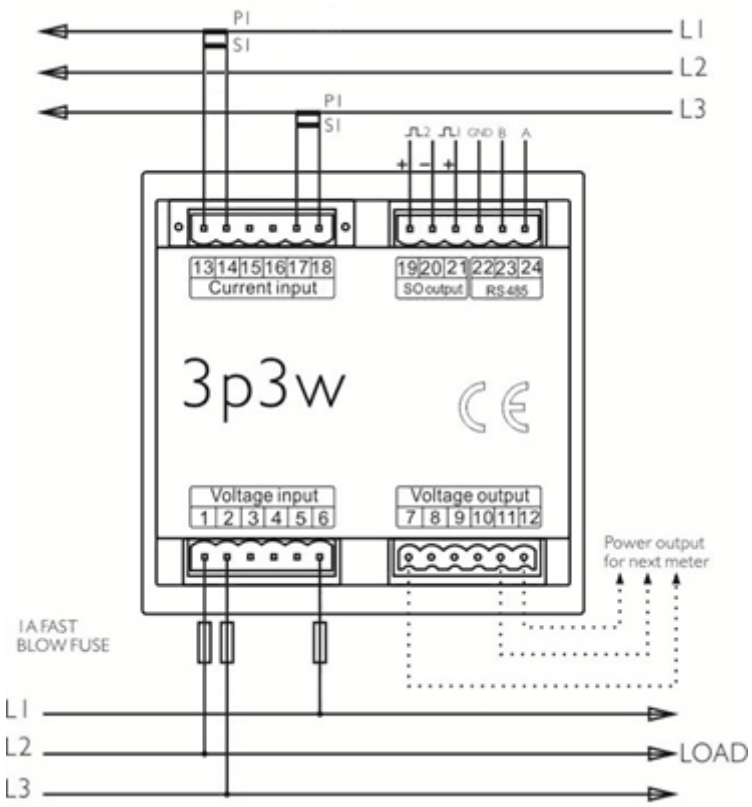
Dimensions



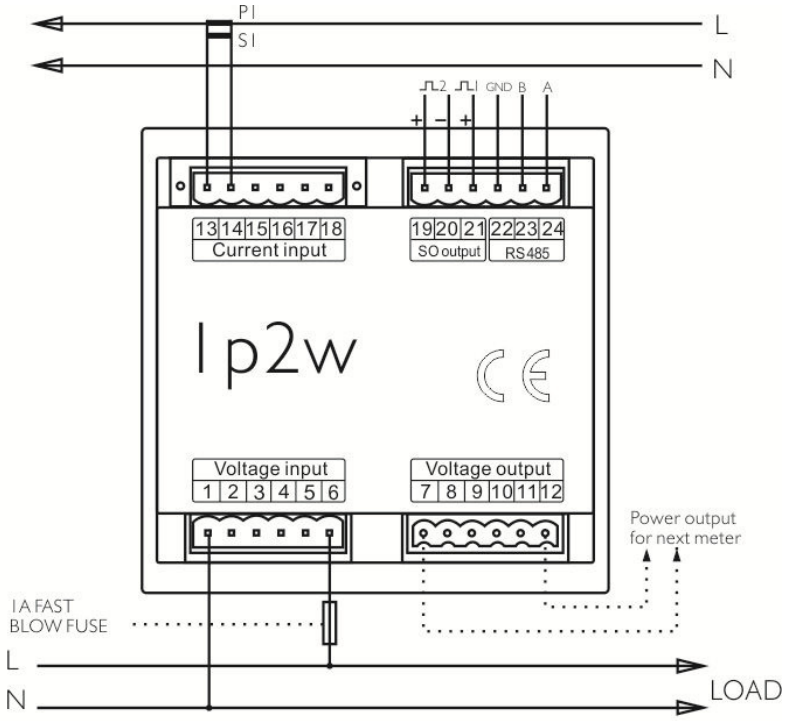
Wiring Diagram



3-Phase 4-Wire



3-Phase 3-Wire



1-Phase 2-Wire

IF you have any question, please feel free to contact our sales team.

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