SDM54 Series

Smart Three Phase Energy Meter

USER MANUAL

2021 V1.2

1. Introduction

The SDM54 measures and displays the characteristics of single phase two wires (1p2w) and three phase four wires(3p4w) supplies, including voltage, frequency, current, power, power factor, active and reactive energy, imported or exported. Energy is measured in terms of kWh and kVArh. Maximum demand on power and current can be measured over preset periods of up to 60 minutes. SDM54 supports max. 100A direct loads per phase, with dual tariff management availability. The meter is designed for DIN-rail mounting, with IP51 front protection. The meter is optionally equipped with pulse outputs, RS485 Modbus port or M-bus port. Configuration can also be done via keypad, which is password protected.

1.1 Unit Characteristics

The SDM54 Series are smart three phase energy meters, covering 3 models with following features and differences:

Model	Measurements	Outputs	Tariff Control
SDM54-M	kWh, kVarh, W, Var, VA, PF, Hz, V, A, Max.dmd. Etc.	2x Pulse outputs; RS485 Modbus	Single tariff
SDM54-MB	kWh, kVarh, W, Var, VA, PF, Hz, V, A, Max.dmd. Etc.	2x Pulse outputs; M-Bus	Single tariff
SDM54--2T	kWh, kVarh, W, Var, VA, PF, Hz, V, A, Max.dmd. Etc.	2x Pulse outputs; RS485 Modbus	Double tariffs

1.2 RS485 Serial - Modbus RTU

The RS485 serial port with Modbus RTU protocol provides a means of remotely monitoring and controlling the unit. Set-up screens are provided for setting up the RS485 port. D/LT645 protocol is optionally available on request.

1.3 M-Bus

The M-Bus port complying with EN13757-3 protocol provides a means of remotely monitoring and controlling the meter. Set-up screens are provided for setting up the M-Bus port.

1.4 Pulse outputs

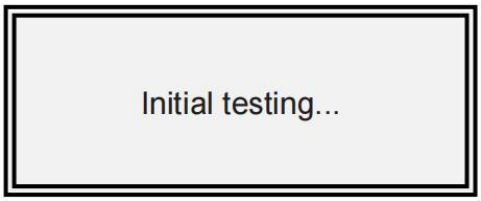
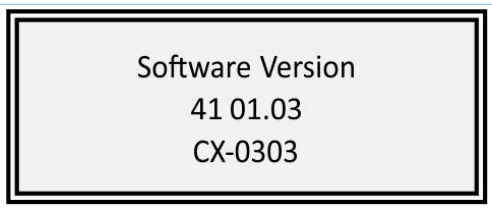
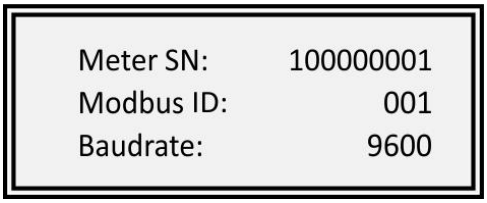
Two pulse outputs that clock up the measured active and reactive energy. The constant of pulse output 2 for active energy is 400imp/kWh (unconfigurable), its width is fixed at 100ms.

The default constant of configurable pulse output 1 is 400imp/kWh, default pulse width is 100ms. The configurable pulse output 1 can be set from the set-up menu.

1.5 Double Tariffs

The meter has double tariffs function for the cost allocation management. There are two terminal to monitor voltage input from external device. Once there are voltage detected within 230V (80~120%), the energy will be counted in another registers.

2. Start-up Screens

1		The interface performs initial testing
2		The second screen indicates the software version.
3		Meter serial number; Modbus ID; Baudrate info.

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

3. Measurements

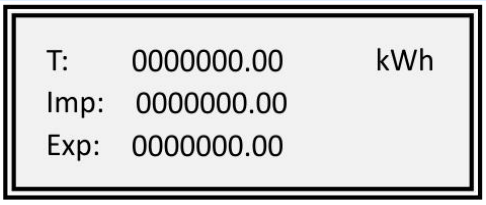
3.1 Buttons

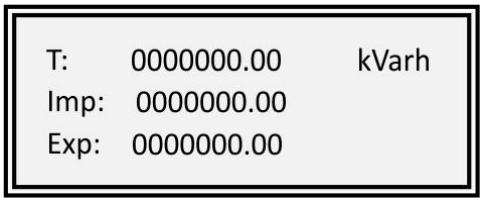
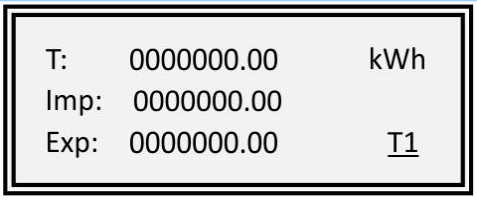
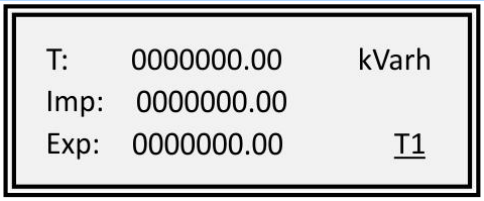
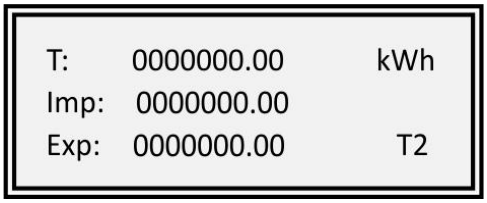
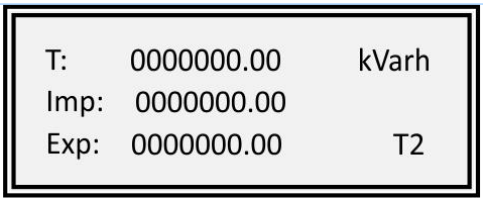
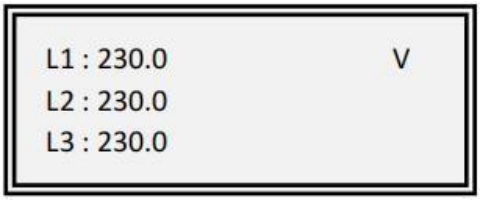
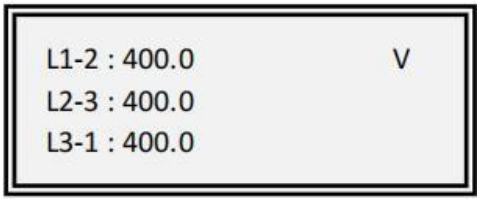
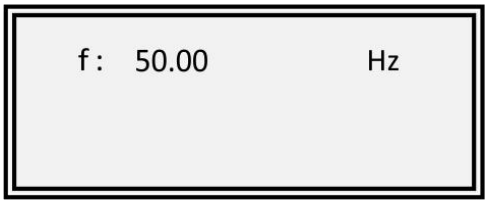
There are two buttons on the front panel.

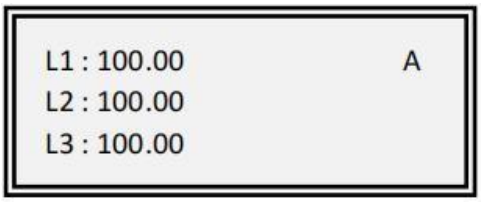
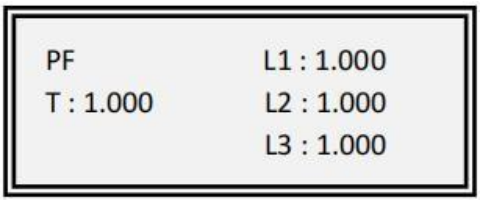
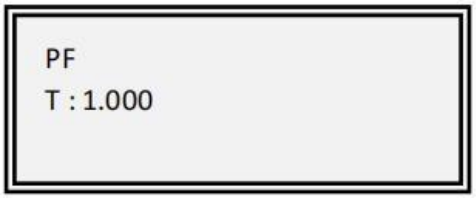
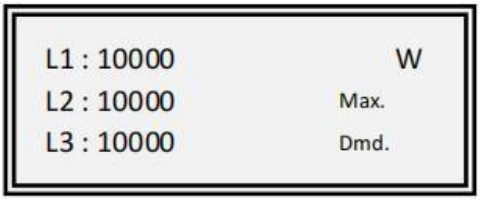
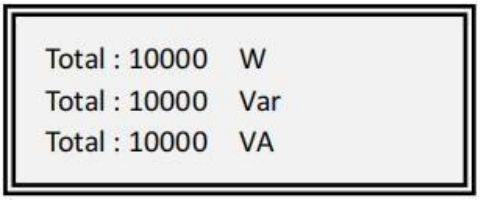
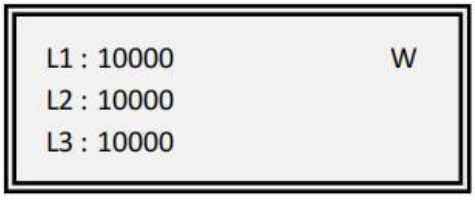
1		> Scroll the display for data-check. > Change option at Set-up mode > Exit the Set-up mode
2		> Set-up mode entry > Confirmation

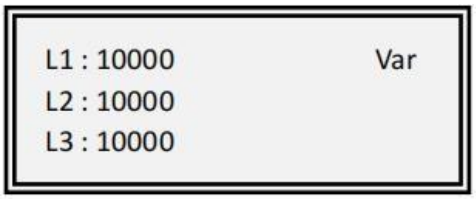
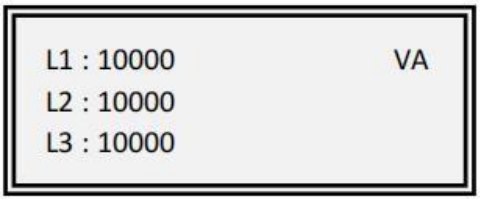
3.2 Measured parameters

Each successive pressing of the  button shows different parameters measured:

1		Total kWh Import kWh Export kWh

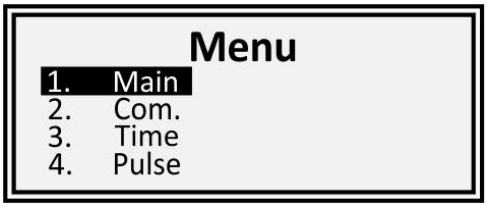
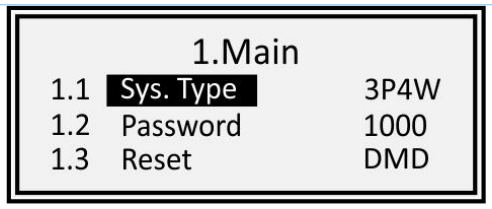
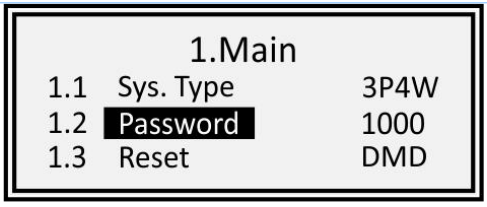
2		Total kVarh Import kVarh Export kVarh
2-1		(Available in **SDM54-2T** only) Tariff 1's active energy Total kWh Import kWh Export kWh The "_" under T1 means tariff 1 is running at the moment.
2-2		(Available in **SDM54-2T** only) Tariff 1's reactive energy Total kVarh Import kVarh Export kVarh
2-3		(Available in **SDM54-2T** only) Tariff 2's active energy Total kWh Import kWh Export kWh
2-4		(Available in **SDM54-2T** only) Tariff 2's reactive energy Total kVarh Import kVarh Export kVarh
3		L1-N Voltage L2-N Voltage L3-N Voltage
4		L1-2 Voltage L2-3 Voltage L3-1 Voltage
		Frequency

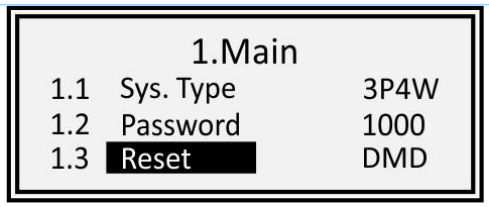
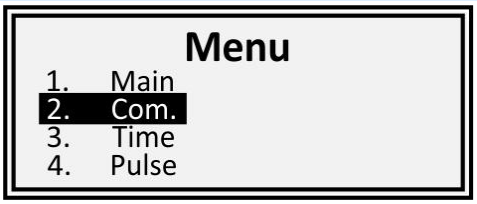
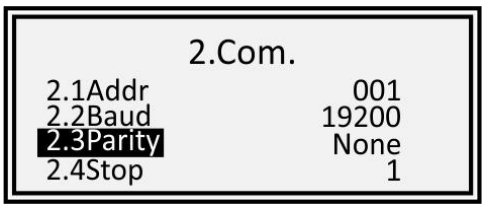
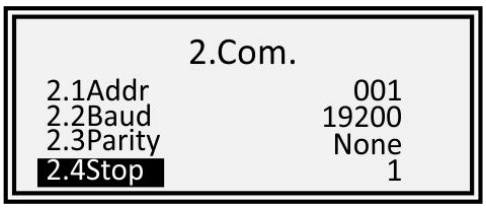
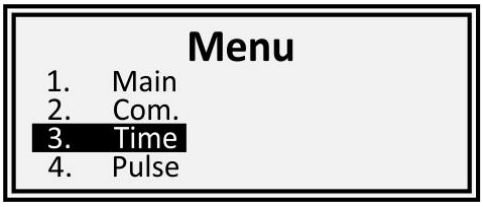
5		L1 Current L2 Current L3 Current
6		Neutral Current
7		Total PF (Power Factor) L1 PF L2 PF L3 PF
8		Total PF (Power Factor)
9		Max. Current Demand of L1 L2 L3
10		Max. Active Power Demand of L1 L2 L3
11		Active Power Reactive Power Apparent Power
12		Active Power of L1 L2 L3

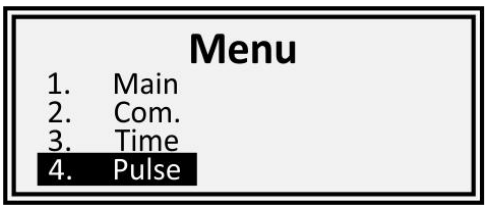
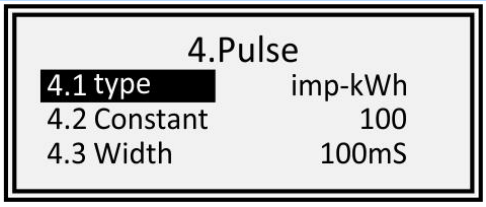
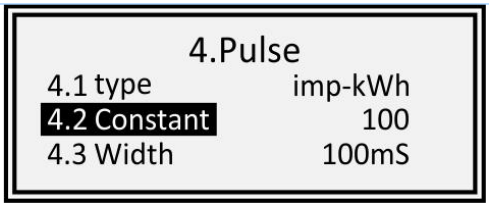
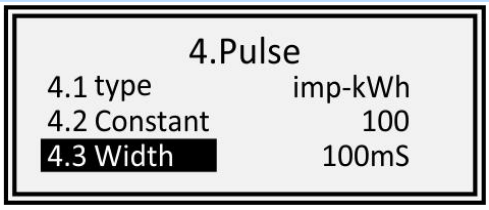
13		Reactive Power of L1 L2 L3
14		Apparent Power of L1 L2 L3

4. Set-up

Keep pressing the button  , the meter will get into Set-up mode.

PASS		Password is needed be checked before any further operation. The default password is 1000.
1		The left screen shows the set-up menu of the meter, including main, communication, time, and pulse.
1-1		System type: the network type where the meter is installed and working. Options: 3P4W(default), 1P3W, 1P2W.
1-2		Password: allows user to set a new password.

1-3		Reset: to reset the Max. dmd information of current and active power.
2		Com.: configure the communication parameters
2-1		Addr: communication MODBUS Address, range from 001~247
2-2		Baud: communication baudrate Options: 2400~38400bps; Default: 9600bps
2-3		Parity: Communication Parity Options: None, Even, Odd Default: None
2-4		Stop: Stop bit of communication Options: 1 or 2 Default: 1
3		Time information setting

3-1		Backlight: to set the backlight duration time after button operation. Options: on, off, 5, 10, 15, 30, 60, 120 minutes. Default: 60 minutes
3-2		Scroll: automatic screen scroll time interval. Options: off, 5,10,15,30,60 seconds. Default: off
3-3		DMD: demand interval time Options: 0, 5, 8, 10, 15, 20, 30, 60 minutes. Default: 60 minutes
4		Pulse output 1 parameter setting The meter pulse output 1 is configurable. Note: Pulse output 2 is fixed to
4-1		Type: the type of energy that pulse output is refer to. Options: kWh; Imp-kWh; Exp-kWh kVarh; Imp-kVarh; Exp-kVarh Default: Exp-kWh
4-2		Constant: Pulse output constant Options: 400,100, 10, 1, 0.1, 0.01 Default: 400
4-3		Width: Pulse width Options: 60,100,200mS Default: 100mS

5. Specifications

5.1 Electrical specifications

- Power: Self power supply (via measured voltage)
- Consumption: <1W, 8VA
- Basic current: 10A
- Max. current : 100A
- Min. current: 0.5A
- Starting current : 0.02A
- Over-current: 30Imax for 0.01s
- L-N voltage: 100 to 289V a.c. (not for 3p3w supplies)
- L-L Voltage: 173 to 500V a.c. (3p supplies only)
- Frequency: 50Hz (MID version)
  50/60Hz (non-MID version)
- Accuracy:

active energy	Class 1(IEC62053-21)/Class B(EN50470-3)
Reactive energy	Class 2 (IEC62053-23)
Voltage	0.5% of range maximum
Current	0.5% of nominal
Frequency	0.2% of mid-frequency
Power factor	1% of unity (0.01)
Active power (W)	±1% of range maximum
Reactive power (VAr)	±1% of range maximum
Apparent power (VA)	±1% of range maximum

5.2 Environmental specifications

- Operating temperature -40°C to +70°C
- Storage temperature -30°C to +80°C
- Relative humidity 0 to 90%, non-condensing @40°C
- Altitude Up to 2000m
- Mechanical environment M2
- Electromagnetic environment E2

5.3 Output specifications

Three interfaces are available:

- Modbus RS485 port output ... (SDM54-M, SDM54-2T)
- M-Bus port output ... (SDM54-MB)
- two Pulse outputs

5.3.1 Modbus RS485 port output

Baud rate: 2400, 4800, 9600(default), 19200, 38400
Parity: none /odd/even
Stop bits: 1 or 2
RS485 address: 001 to 247
Response time: <80mS
Transmission distance: 1000m

5.3.2 M-Bus port output

Baud rate： 300, 600, 1200, 2400, 4800, 9600

Parity： even/odd

Stop bits： 1 or 2

M-Bus primary address: 001 to 250

M-Bus Secondary address: same as the serial number of the meter.

5.3.3 Pulse Output

The unit provides two pulse outputs indicating real-time measured energy. Pulse output 1 is configurable; Pulse output 2 is fixed with constant 400imp/kWh.. Both pulse outputs are passive type.

Pulse output 1 is configurable. Default setting is exp-kWh; 100mS, constant 400imp/kWh

Pulse output 2 is non-configurable. It is fixed up with active kWh. The constant is 400imp/kWh.

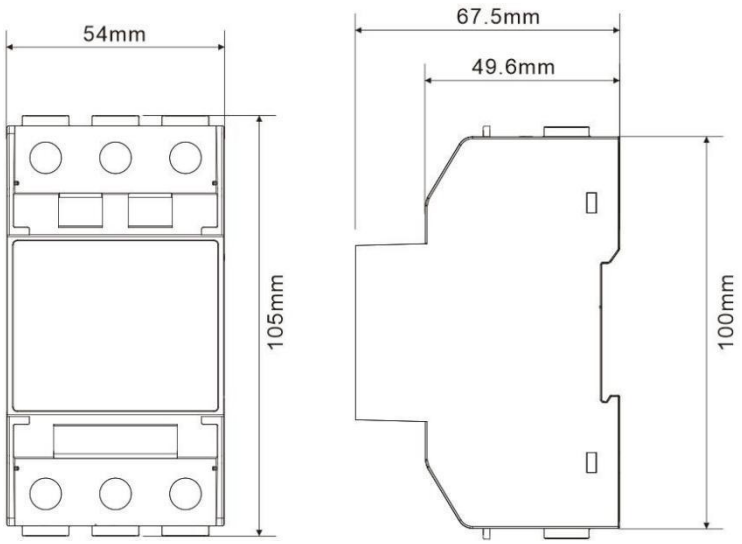
5.4 Safety and EMC

- Measurement category IEC 61010-1 CAT III
- Current input Direct connect
- Over-voltage category CAT III
- Dielectric withstand IEC 61010-1 double insulated
- Protective class II
- EMC IEC 61326-1:2013 ; IEC 61326-2-3:2013

5.5 Mechanics specifications

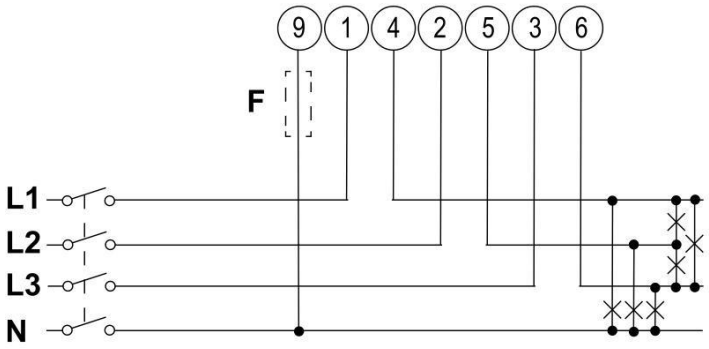
- DIN rail dimensions 54x100x67.5mm(WxHxD)
- Mounting DIN Rail 35mm
- Ingress protection IP51 front panel (indoor)
- Material Self-extinguishing UL94 V-0
- Weight 265g

6. Dimensions

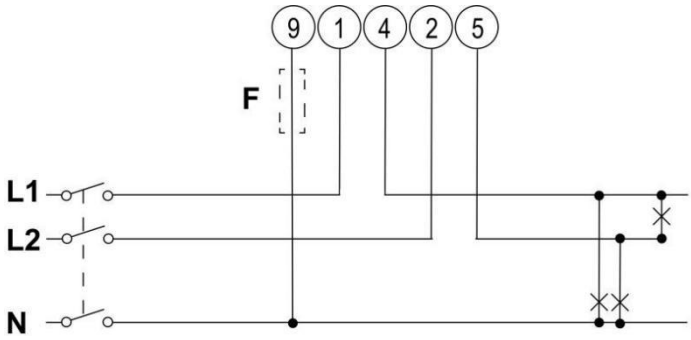


7. Wiring diagram

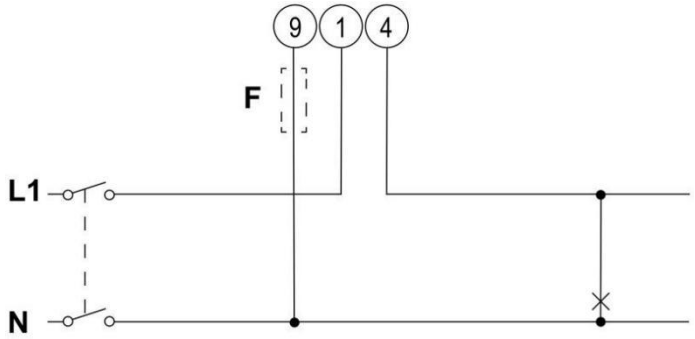
- **Three Phase Four Wires：**



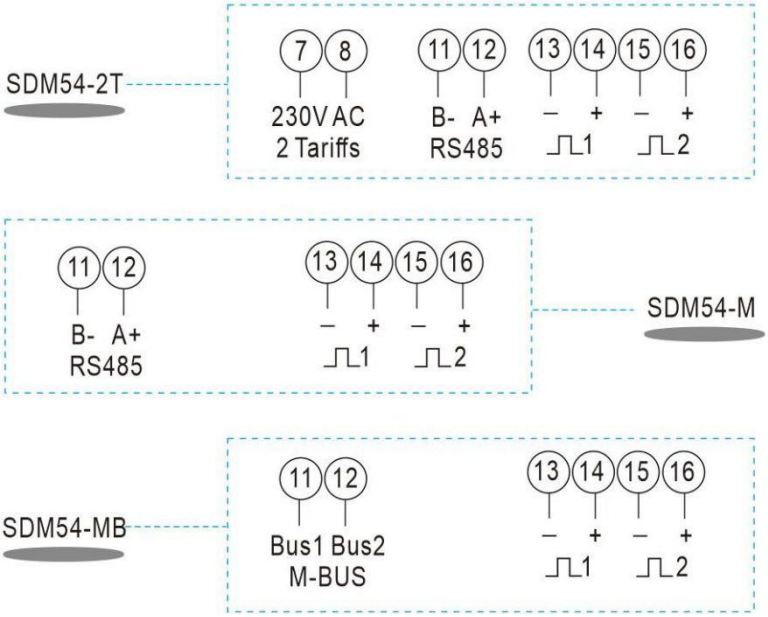
- **Single Phase Three Wires：**



- **Single Phase Two Wires：**



- **Other terminals**



CONTACT US

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

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