

## Description

The AEM-DRA series has 2 independent and isolated main circuit inputs, can use for different power system. Up to 24 single phase or 8 three-phase circuits, programmable from push buttons with LCM display panel, or using Adtek program software through RS485 communication port.  
 Hardware standard built in a RS485 Modbus communication port, 2 Digital inputs, 4 Relay outputs, LCM and 2 MB flash for data-logging.  
 Optional second communication port for Ethernet, ProfiBus, LonWorks, BACnet and Zigbee solutions.  
 Din rail mounting, compact and easy installation, programming through computer and push buttons easy to use.

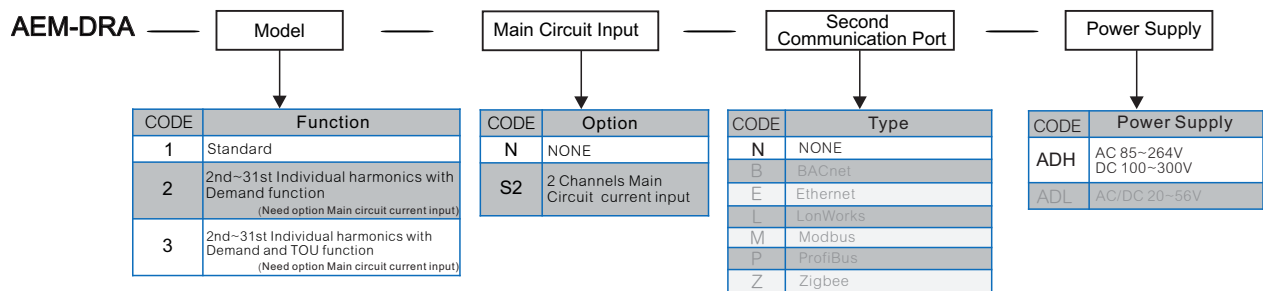
## Features

- Up to 24 single phase or 8 three-phase sub-circuit metering, can be program according to your needs.
- Sub circuit voltage can be assigned via software without change of actual wiring.
- Optional 2 Main circuit measurement, each isolation for use in 2 different power input system.
- 4 Relay outputs, up to 48 parameters setting for alarm
- 128 X 64 dots matrix LCM with white backlight
- Optional second communication port for Modbus, LonWorks, ProfiBus, BACnet, Ethernet or Zigbee
- Main circuit and sub-circuit current input for clamp type split-core CT.

## Applications

- Rental buildings / house apartment/marketplace
- School hostel / exhibition stall
- Shopping centers, shops
- Mainly for distributed electricity measurement.

## Ordering Information



## Meter Selection Guide

Features		DRA1	DRA2	DRA3
Voltage	Per phase and 3-phase of Main circuit and Sub-circuit	●	●	●
Current	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Active Power	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Reactive Power	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Apparent Power	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Power Factor	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Frequency	Frequency of Main circuit	●	●	●
Active Energy	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Reactive Energy	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Apparent Energy	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
THD/Voltage	Per phase and 3-phase of Main circuit	●	●	●
THD/Current	Per phase and 3-phase of Main circuit and Sub-circuit	◎	●	●
Individual harmonic	2nd~31st Individual harmonics of Main circuit		●	●
Demand	Per phase and 3-phase of current and power		●	●
Unbalance	Current and voltage		●	●
Max/Min Values	Per phase and 3-phase of parameters values	◎	●	●
External Control Input	DI1 DI2	●	●	●
Digital Output	PO		●	●
Relay Output	RO1 RO2 RO3 RO4	●	●	●
Time of Use	4 seasons, 8 tariff settings per day, Per year or up to 5 years setting		●	●
Date and Time	Year, Month, Day, Hour, Minute, Second	●	●	●

◎Parameters of Main circuit need option current input

## Accuracy & Resolutions

PARAMETER	ACCURACY	RESOLUTION	MEASUREMENT RANGE
Voltage	0.2%	0.1V	40.0~400.0Vac(V <sub>LN</sub> )
Current	0.2%	0.001A	1%~120% CT rating current
Neutral Current	1.0%	0.001A	1%~120% CT rating current (Main circuit only)
Active Power	0.5%	1W	-999999999~999999999W
Reactive Power	0.5%	1Var	-999999999~999999999Var
Apparent Power	0.5%	1VA	0~999999999VA
Power Factor	0.5%	0.001	±1.000
Frequency	0.1%	0.01Hz	45.00~65.00Hz
Active Energy	0.5%	0.1kWh	0~99999999.9kWh
Reactive Energy	0.5%	0.1kVarh	0~99999999.9kVarh
Apparent Energy	0.5%	0.1kVAh	0~99999999.9kVAh
THD	1.0%	0.1%	0~100.0%
Individual harmonic	1.0%	0.1%	0~100.0%
Unbalance	0.5%	0.1%	0~300.0%

\*Accuracy non-include clamp CT ratio error

## Electrical Characteristics

Measurement: True rms  
 Circuit loop: 2 channels main circuit input are isolated  
 8 channels three-phase or 24 channels single-phase sub-circuit input  
 Display update rate: 0.5 Second  
 Metering system type: 1P2W, 1P3W, 3P3W, 3P4W  
 Input Range: Voltage:  
 PT Primary side ratio: 100V~9999KV  
 PT Secondary side ratio: 50~600V  
 Direct Input: ≤ 600V<sub>LL</sub> or ≤ 400V<sub>LN</sub>  
 Current:  
 Main circuit input: 5A  
 Sub-circuit input: 333mA  
 CT Primary side ratio: 5~9999A  
 Frequency: 45~65Hz  
 Metering over range: Voltage: 1.2X rated voltage continuous (600V max)  
 Current: 1.2X rated current of CT

## Power Quality

THD: Total harmonic distortion for voltage and current  
 Individual harmonic: 2nd~31st individual harmonics for voltage and current

## Display Characteristics

Dot Matrix LCM: 128\*64 dots matrix with white backlight  
 LED Indicator: Power/COM1/ COM2/ Data logging

## Demand

Calculation method: Slide / Fix

**Relay Output(RO)**

Relay contact form: 4 sets SPST(1a) ; 5A/250Vac ; 5A/30Vdc  
 Relay action mode: Hi / Lo / Hold / Lo.Hold;  
 Alarm setpoints : Up to 48 parameters for alarm setting

**External Control Input (ECI)**

Input mode: 2 channels ECI input ; mchanical contact or open collector input are available  
 Input function: Can set up for DI / Demand start and stop / Demand reset / Max. Demand reset / Energy values reset / Max. and Min. values reset / Relay reset  
 Debouncing time: 0~99 (x8mS) programmable

**Digital Output(DO)**

Output mode: Open collector(O.C.)  
 Output: 30Vdc,30mA(max)  
 Output frequency: 40Hz (max)  
 Energy pulse output: 3200 Pulse/kWh; duty cycle 50% ; from Ma

**TOU (Time of Use)**

4 Seasons: 1~4 seasons per year  
 8 Tariff setting: 1~8 each day(For peak, mid peak, off peak per day for billing)  
 Parameters of TOU : AE-Imp \ AE-Total \ RE- Imp \ RE-Total \ SE \ SE-Total  
 Yearly setting: Tariff setting for 1 year or set up to 5 years

**Data Logging**

Setting: Load setting from previous saved file or set according to needs.Time interval from 1~32767 for second, minute, hour or day, depend on value record needs.  
 Memory storage: 2MB Flash ROM

**Communication**

Protocol: Modbus RTU mode  
 Baud rate: 1200/2400/4800/9600/19200/38400  
 Data bits: 8 bits  
 Parity: None / Even / Odd  
 Stop bit: 1 or 2  
 Address: 1~247  
 Distance: 1200M max  
 Terminate resistor: 120~300Ω/0.25W(typical: 150Ω)

**Environmental Characteristics**

Operating temp.: 0~60°C  
 Humidity rating: 5~95%RH, Non-condensing  
 Temp. coefficient: 100 PPM/°C  
 Storage temp.: -30~80°C  
 Humidity 0~95%RH, Non-condensing

**Power Supply**

Range: ADH:AC 85~264V ; DC 100~300V  
 ADL : AC/DC 20~56V  
 Power consumption: AC:15VA ; DC:5W

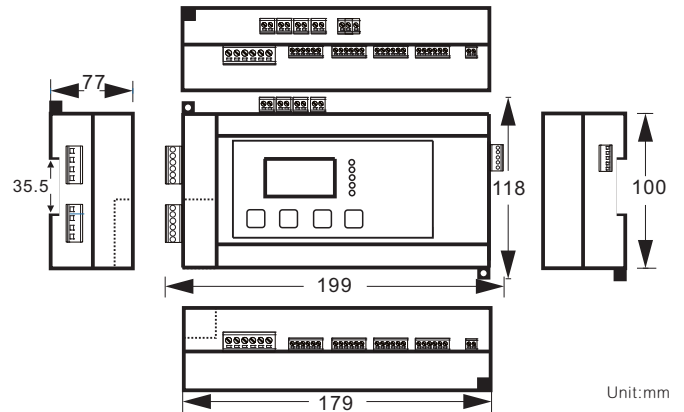
**Mechanical Characteristics**

Dimensions: 199mm(L)x118mm(W)x77mm(H)  
 Material: ABS, Black (with fire-retardant)  
 Mounting: 35mm DIN Rail (En50022)  
 IP Enclosure: Ip20  
 Wire terminal: Main circuit Voltage / Current input: AWG:28~12 / 0.2~2.5mm<sup>2</sup>  
 Screw Torque Value: M2.5 / 5.202kgf.cm (Max)  
 Sub-circuit Current and others input: AWG:28~14 / 0.2~1.5mm<sup>2</sup>  
 Screw Torque Value: M2 / 2.04kgf.cm (Max)  
 750g±20g

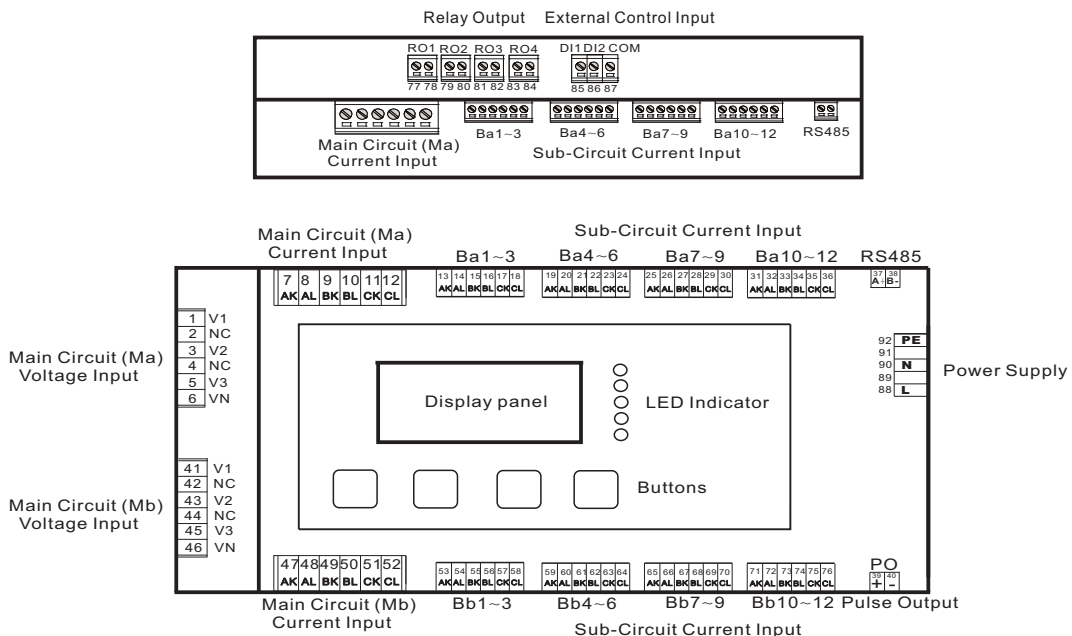
**Safety**

Isolation: AC 2KV,50/60Hz,for 1 min, Between Power / Input / Output / Case  
 Insulation resistance: ≥ 100MΩ @ 500V<sub>dc</sub>  
 EMC: EN61326:2006  
 LVD: EN61010:2010

**Dimensions**



**Device Connection Assignment**



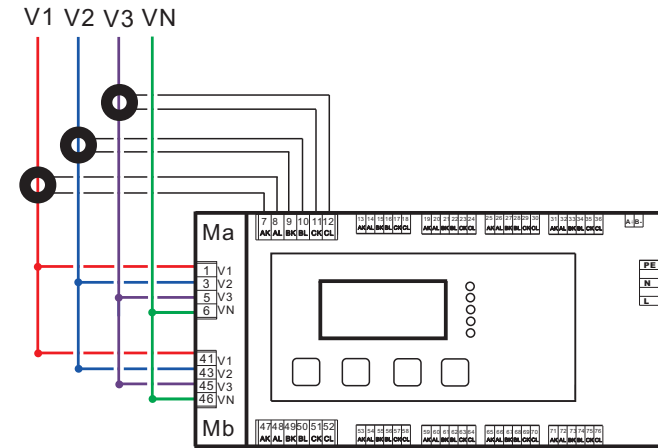
**Metering System Type Connection - Main Circuit (Ma、Mb)**

Ma and Mb inputs are isolated, main circuit current input 5A, different metering system connection is allowed. Voltage input same as example, when there is only one main current input, refer to below examples

AEM DRA

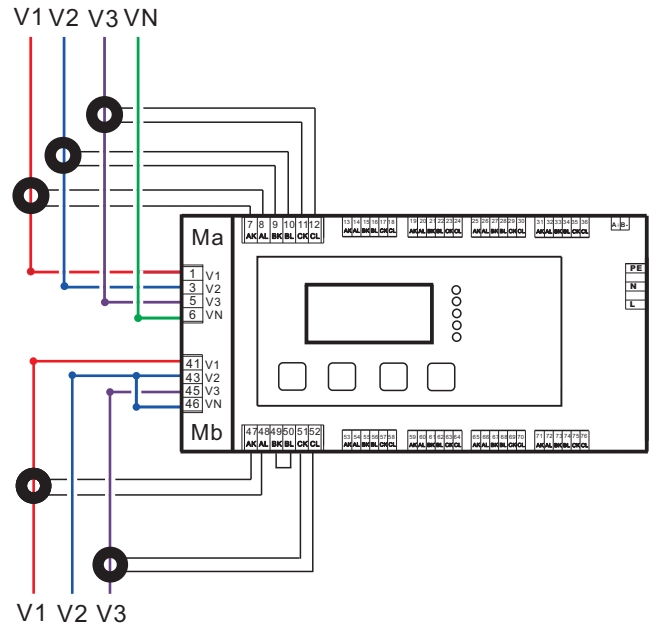
Example 1:

Single Main Circuit:3P4W  
CT input can be connected to Ma or Mb.



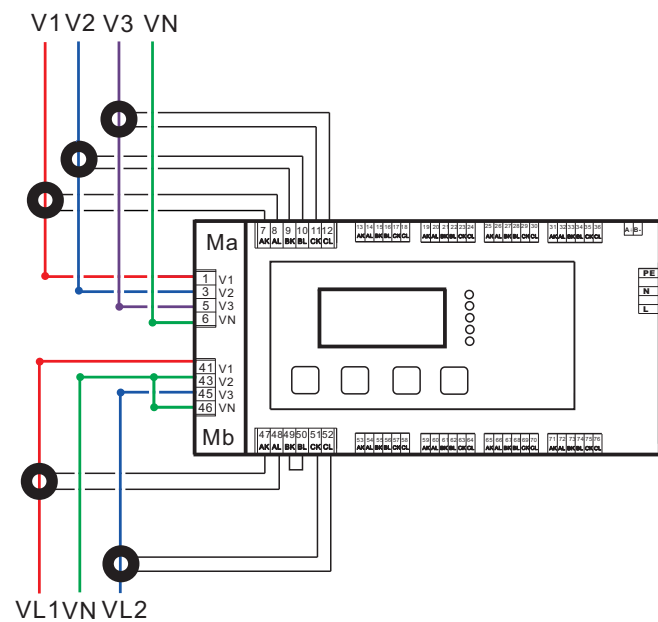
Example 2:

Double Main Circuit:3P4W+3P3W



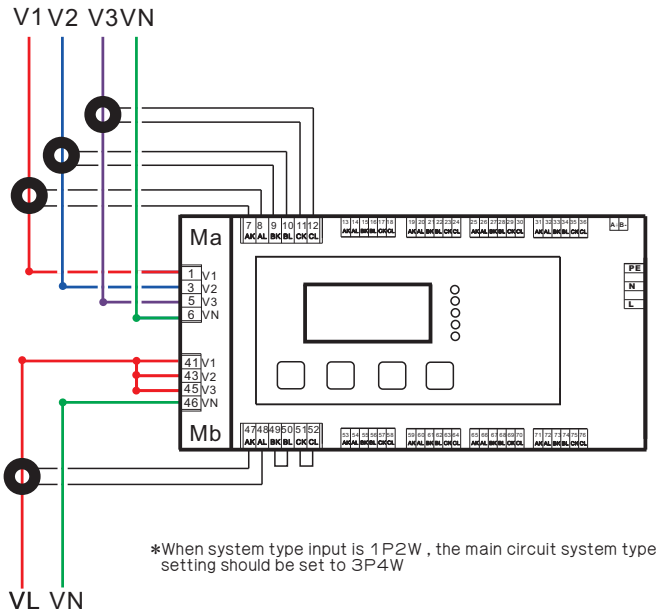
Example 3:

Double Main Circuit:3P4W+1P3W



Example 4:

Double Main Circuit :3P4W+1P2W



\*When system type input is 1P2W , the main circuit system type setting should be set to 3P4W

**Metering System Type Connection - Sub- Circuit** (Attention: Clamp CT secondary side output is 333mVac)

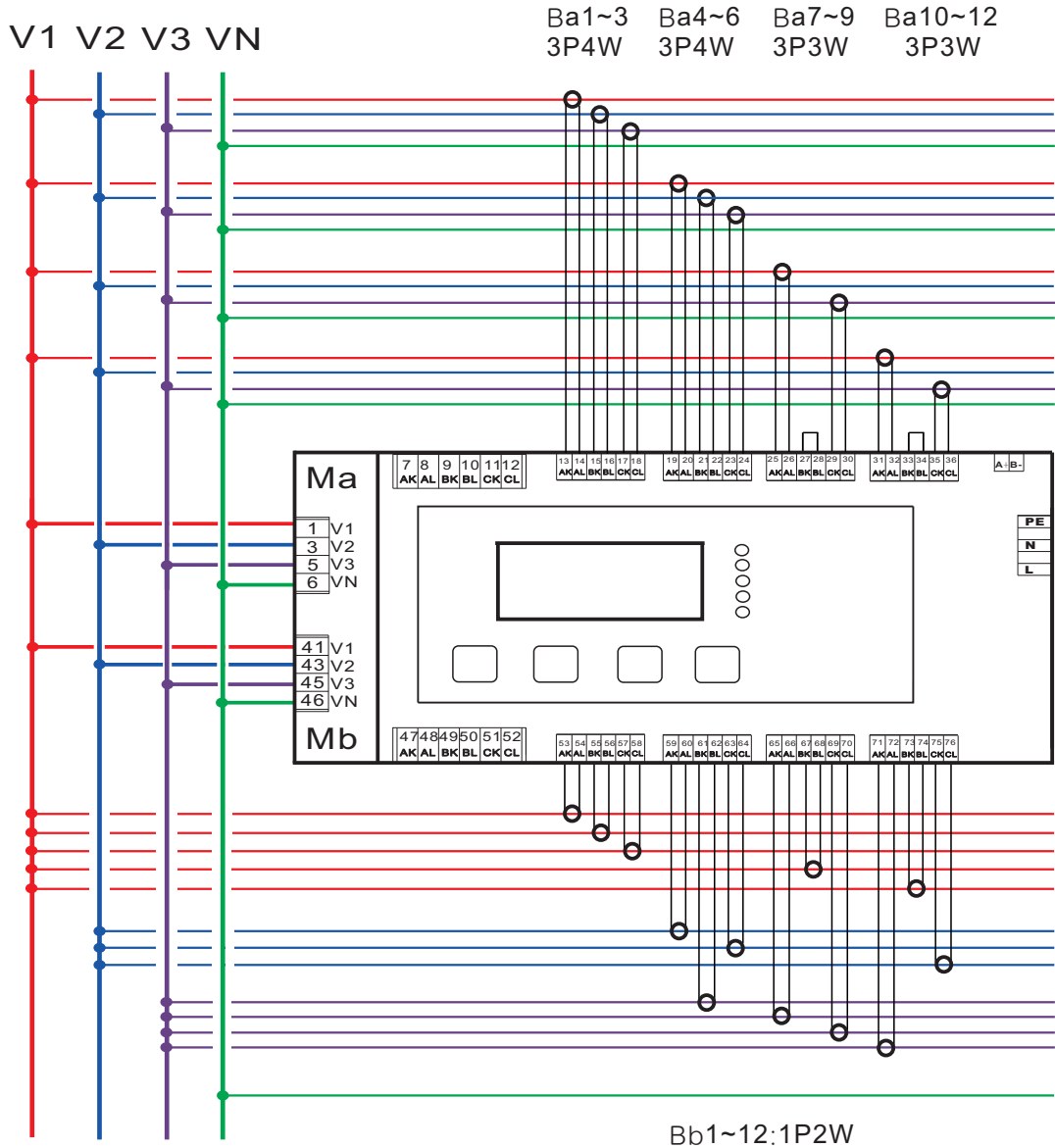
The voltage phase of each sub-circuit (ex. Ba1~3) are refer to main circuit voltage input V1~V3 , others sub-circuit sets same as . And the voltage phase of sub-circuit can be change to refer different phase of voltage input , depend upon which phase was CT metering .

The metering system type could be set up independent of each sub-circuit set , but will be limited to main circuit system type .Refer to table as below :

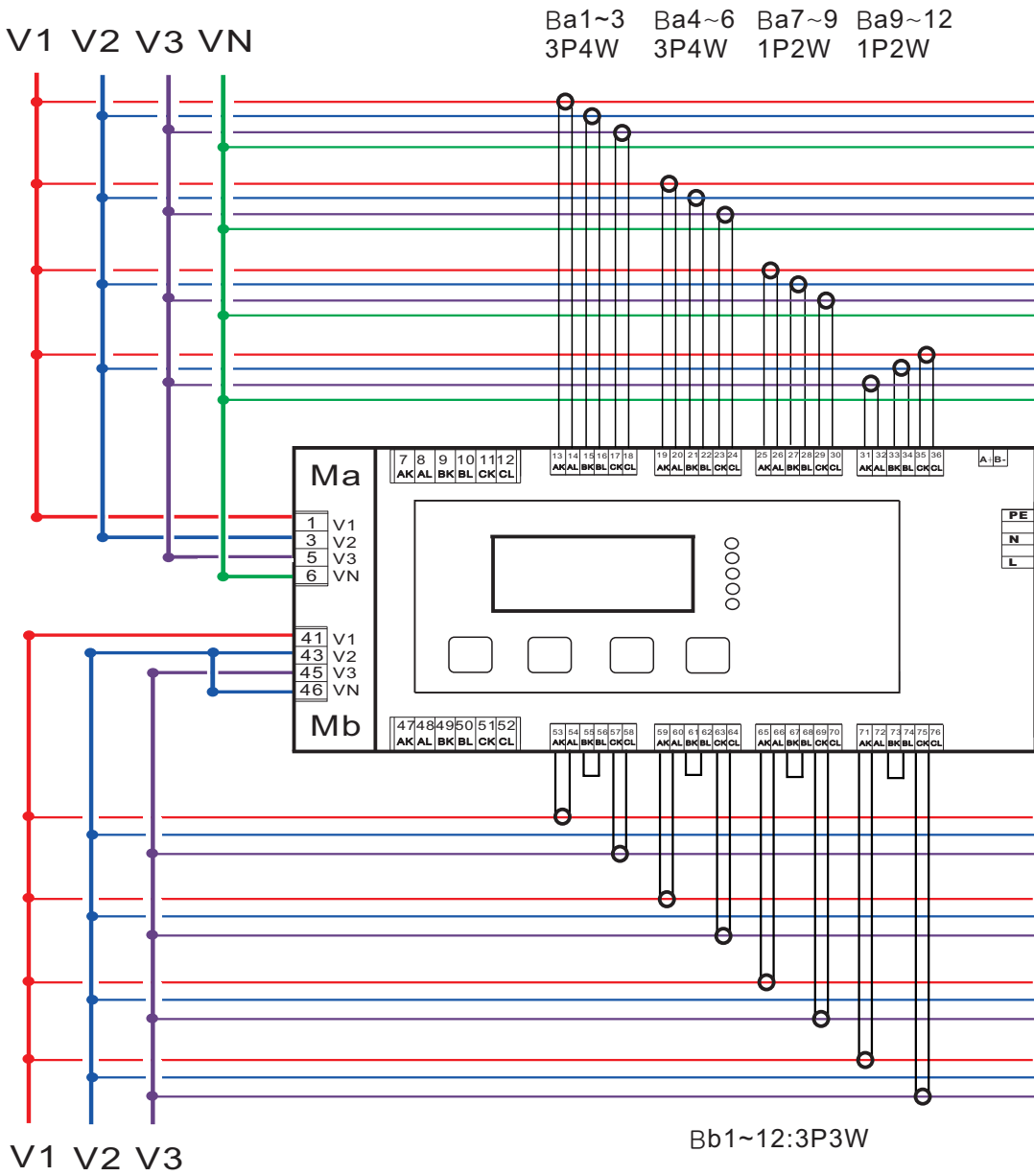
Main Circuit System Type	Sub Circuit set up			
	1P2W	1P3W	3P3W	3P4W
1P2W	○	×	×	×
1P3W	○	○	×	×
3P3W	×	×	○	×
3P4W	○	×	○	○

Example1:

Main Circuit System Type: Ma=Mb=3P4W

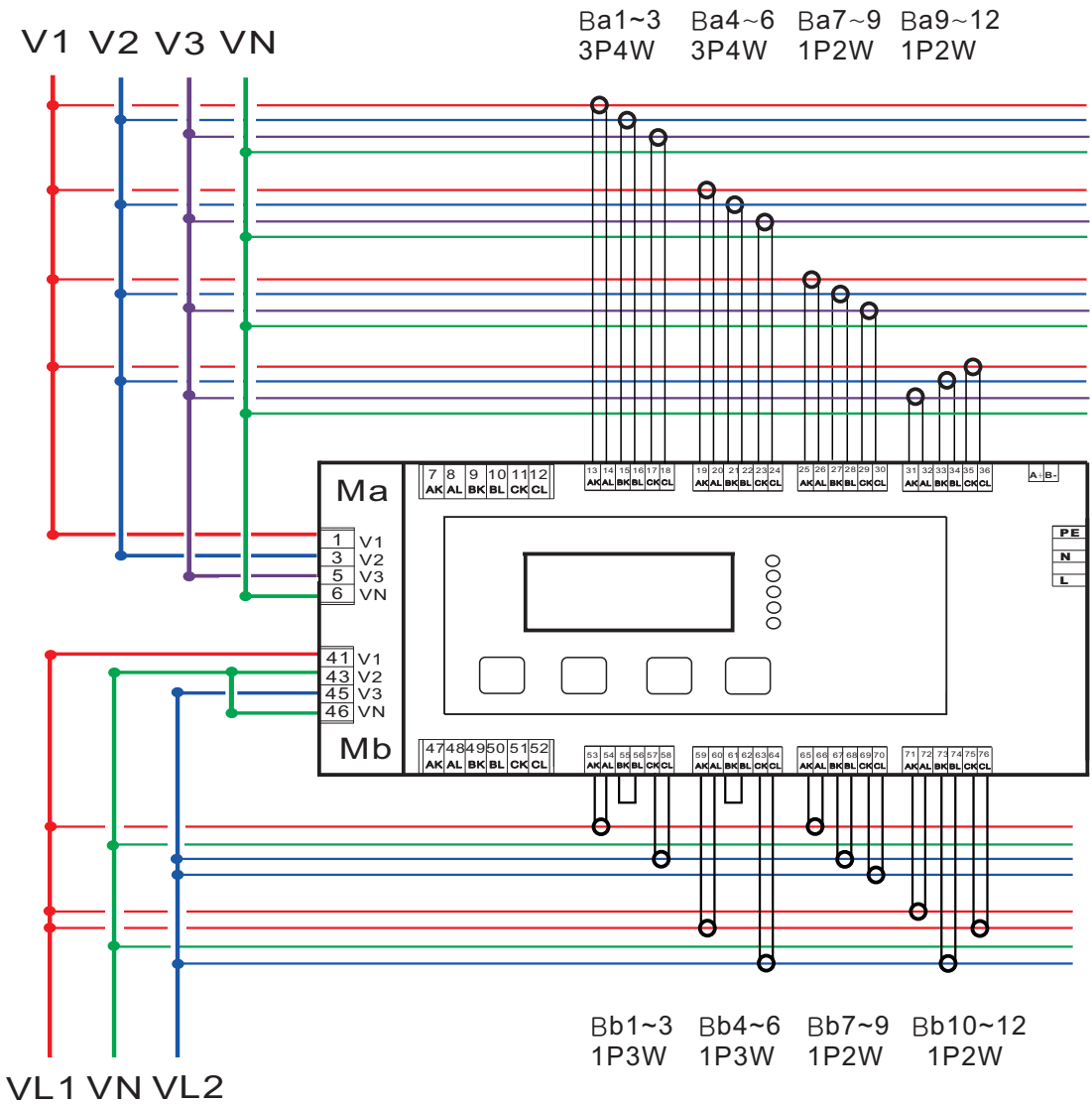


Example2:  
 Main Circuit System Type :Ma=3P4W  
 Mb=3P3W

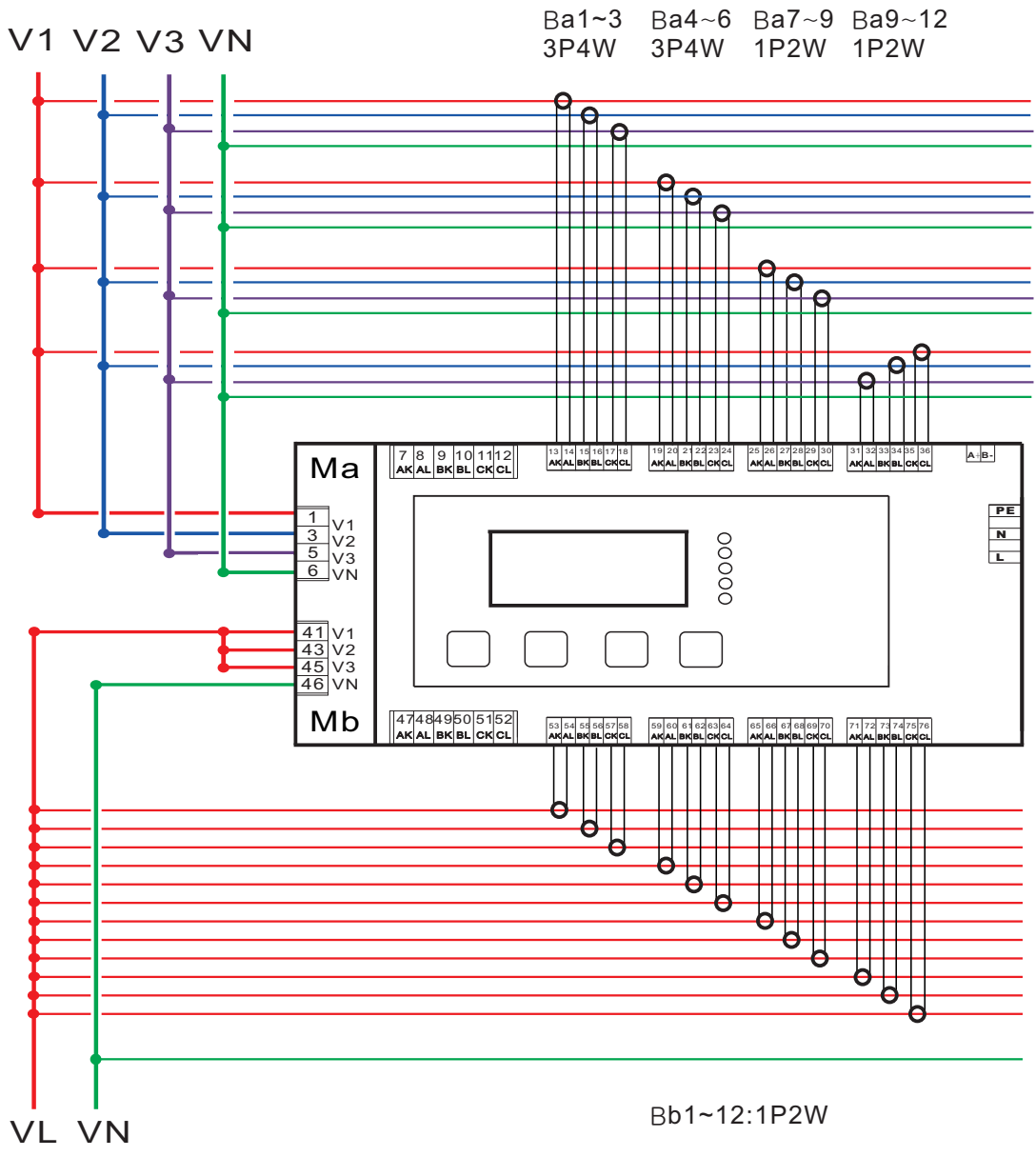


Example3:

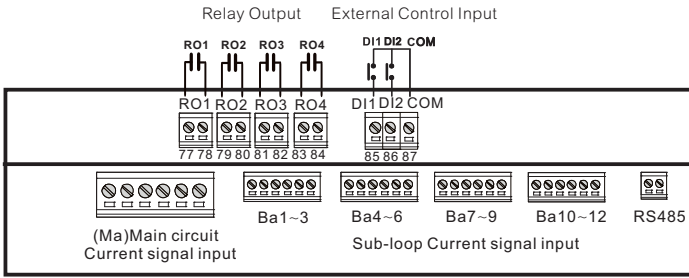
Main Circuit System Type: Ma=3P4W  
Mb=1P3W/1P2W



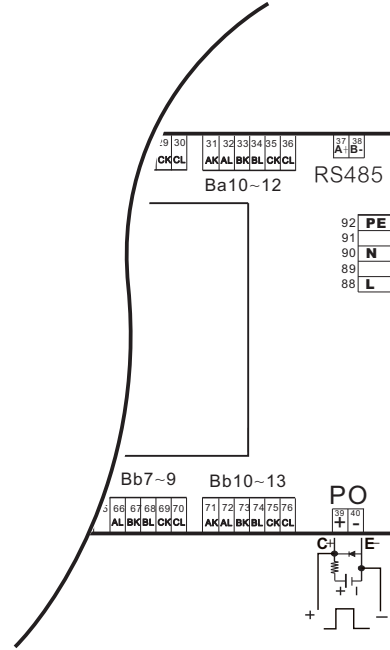
Example4:  
 Main Circuit System Type: Ma=3P4W  
 Mb=1P2W



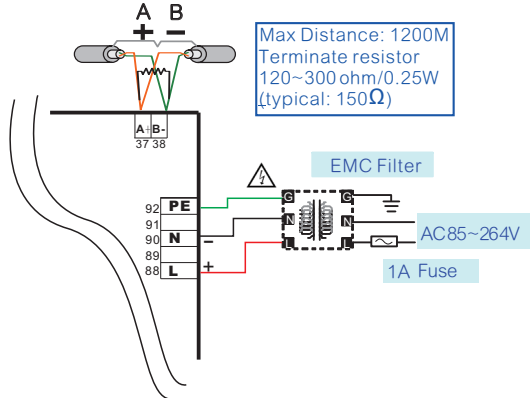
## Output & Input Connection



## Digital Output Connection



## Communication and Power Supply



## Clamp CT Selection Guide

**US-CTV** — Hole Dimensions — Rated Current

CODE	Dimensions	CODE	Primary Side
10	Φ 10	005A	5A
16	Φ 16	060A	60A
		100A	100A
		150A	150A
24	Φ 24	200A	200A
		*300A	300A
*35	Φ 35	*400A	400A
		*600A	600A

\*(MOQ 100 pcs)



Item	Primary Side (A)	Secondary Side (mV)	Accuracy %F.S.	Ratio	Weight (g)
US-CTV-10-005A	5	333	1.0	2000:1	60
US-CTV-16-060A	60	333	0.5	3000:1	100
US-CTV-16-100A	100	333	0.5	3000:1	100
US-CTV-24-150A	150	333	0.5	3000:1	205
US-CTV-24-200A	200	333	0.5	3000:1	205
US-CTV-35-300A	300	333	0.5	3000:1	375
US-CTV-35-400A	400	333	0.5	3000:1	375
US-CTV-35-600A	600	333	0.5	3000:1	375