AEM-DRA Multi-Circuit Power Meter

ADTEK

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, BACnet and Modbus solutions. Din rail mounting , compact and easy installation, programming through computer and push buttons easy to use.

FCC and CE Approved.

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, BACnet , Ethernet.
- Main circuit and sub-circuit current input for clamp type split-core CT.

Applications

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

Ordering Information

AEM-DRA —— Model —— Main Circuit Input —— Second Communication Port —— Power Supply

CODE	Function
1	Standard
2	2nd~31st Individual harmonics with Demand function (Need option Main circuit current input)
3	2nd~31st Individual harmonics with Demand and TOU function (Need option Main circuit current input)

CODE	Option
N	NONE
S2	2 Channels Main Circuit current input

CODE	Type
N	NONE
M	Modbus
E	Ethernet
B	BACnet

CODE	Power Supply
ADH	AC 85~264V DC 100~300V
ADL	AC/DC 20~56V

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_{LN})
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	-0.020~+1.000~0.020
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_{LL} or ≦ 400V_{LN}
Current:
Main circuit input:5A
Sub-circuit input:333mV
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) programable

Pulse Output(PO)

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 (Include 2nd RS485)

Protocol: Modbus RTU mode
Baud rate: 1200/2400/4800/9600/19200/38400 bps
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)

Ethernet (Optional)

Network interface: 10M / 100M BASE-T
Protocol: Modbus TCP / IP

Environmental Characteristics

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

Power Supply

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

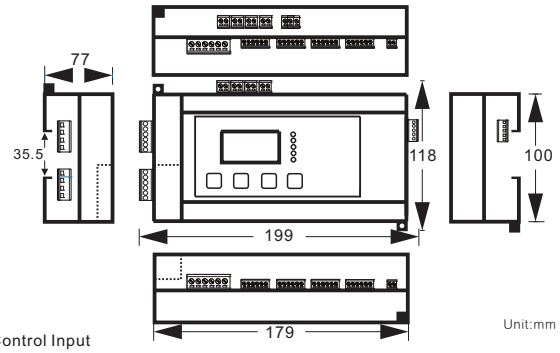
Mechanical Characteristics

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 / 0.2~2.5mm²
Screw Torque Value: M2.5 / 5.202kgf.cm (Max)
Sub-circuit Current and others input:
AWG:28~14 / 0.2~1.5mm²
Screw Torque Value: M2 / 2.04kgf.cm (Max)
Weight: 750g±20g

Safety

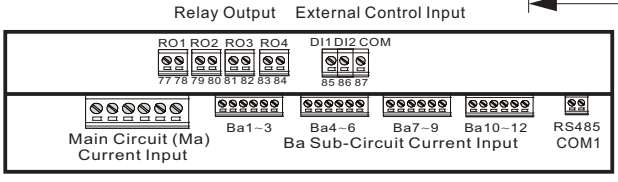
Isolation: AC 2KV,50/60Hz,for 1 min, Between Power / Input / Output / Case
Insulation resistance: ≧100MΩ @ 500Vdc
EMC: EN61326-1:2013
EN55011:2009+A1:2010
EN61000-3-2:2014
EN61000-3-3:2013
IEC61000-4-2:2008
IEC61000-4-3:2010
IEC61000-4-4:2012
IEC61000-4-5:2014
IEC61000-4-6:2013
IEC61000-4-8:2009
IEC61000-4-11:2004
LVD: EN61010-1:2010
FCC: FCC PART15 SUBPART B 2013

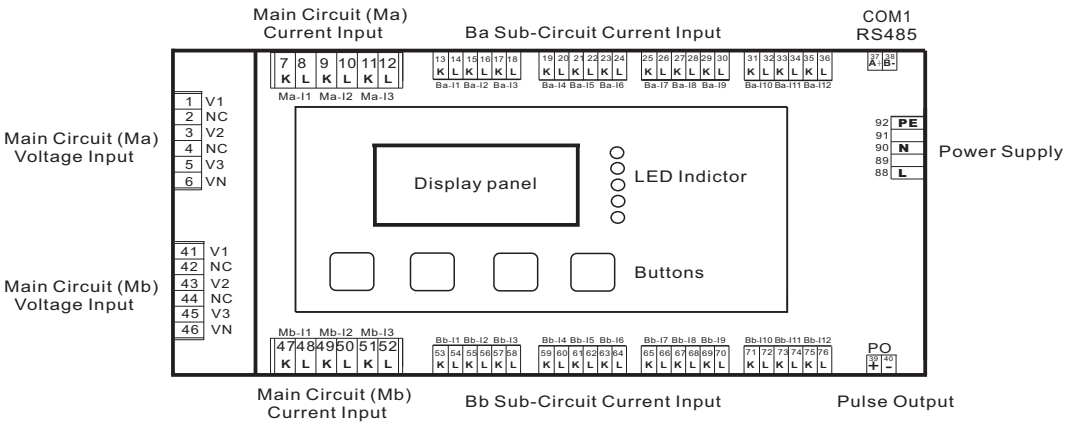
Dimensions



Unit:mm

Device Connection Assignment



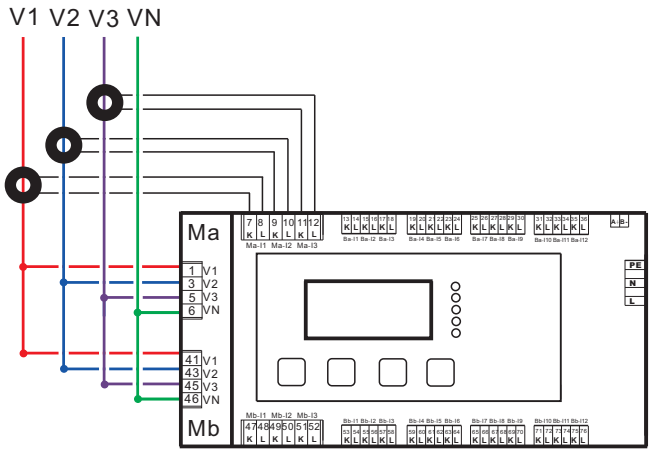


Metering System Type Connection - Main Circuit (Ma、Mb)

Ma and Mb inputs are isolated, main circut 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

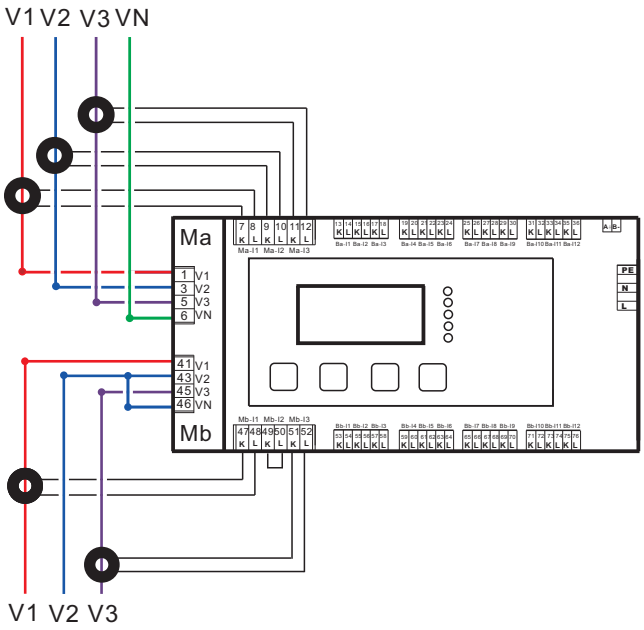
Example 1:

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



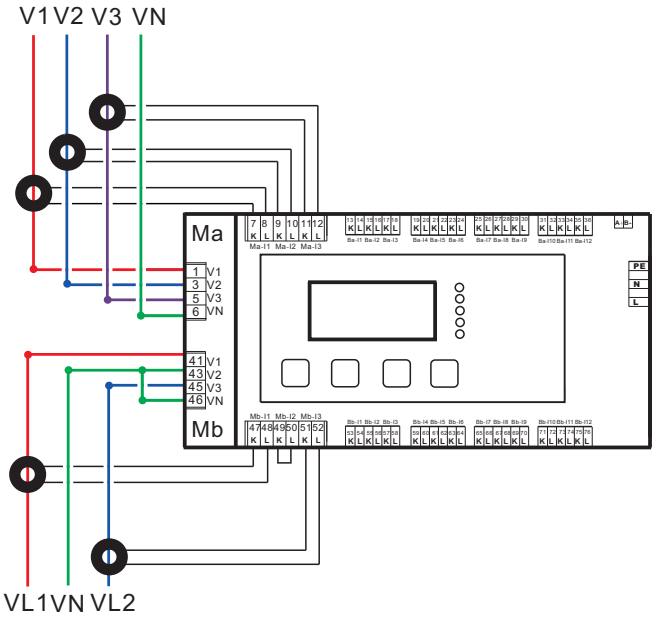
Example 2:

Double Main Circuit:3P4W+3P3W



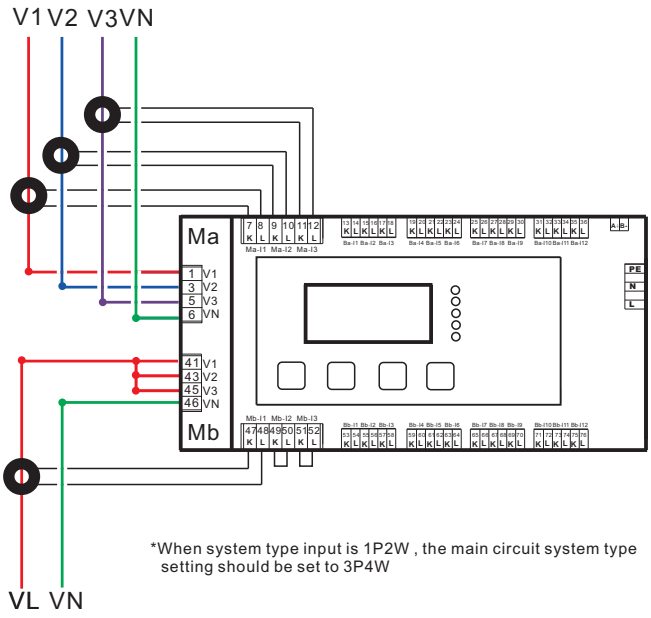
Example 3:

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)

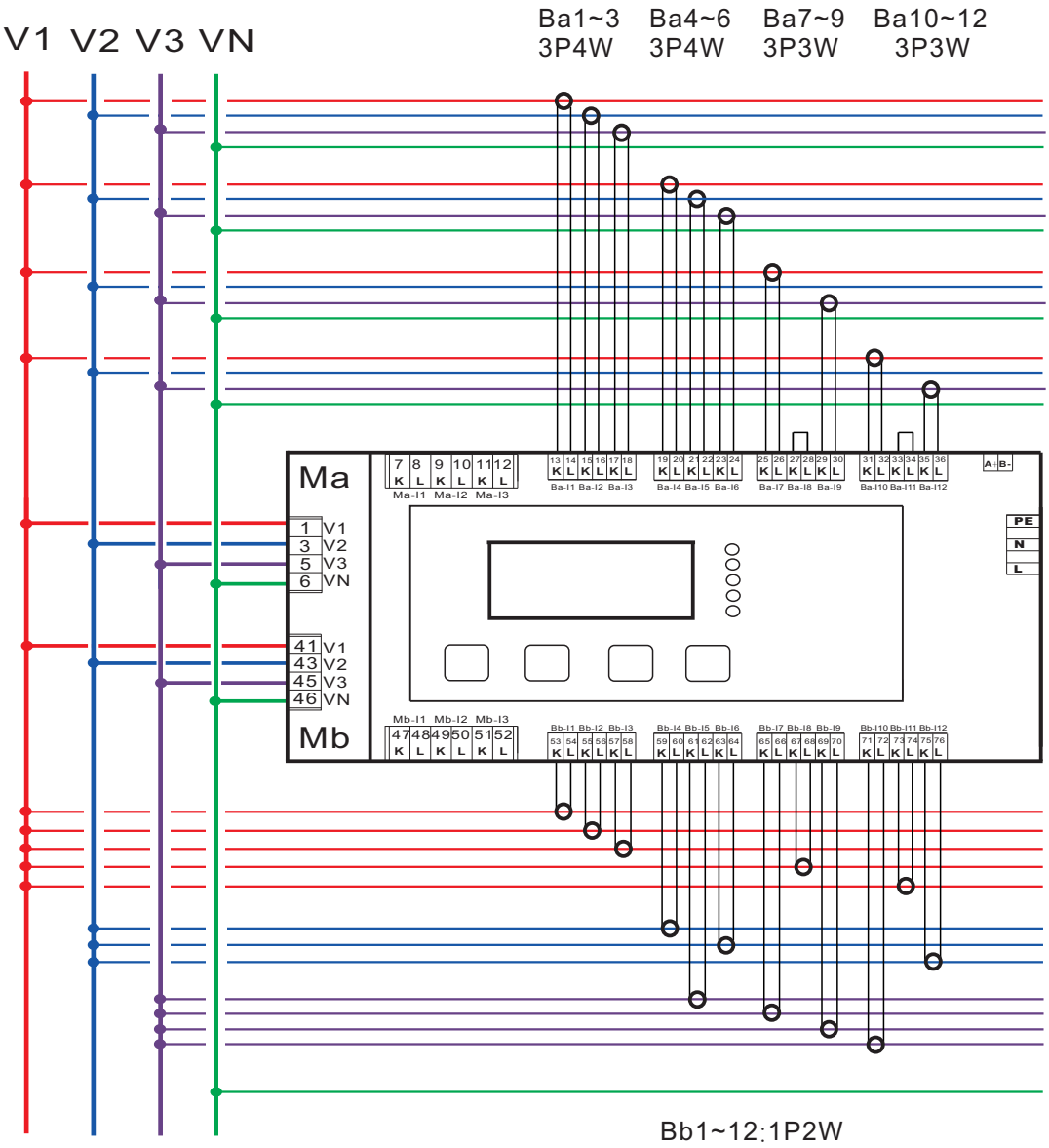
The voltage phase of each sub-circuit (ex. Ba1~3) are refer to main circuit voltage input V1~V3 , others sub-circuit sets same as . And the voltage phase of sub-circuit can be change to refer different phase of voltage input , depend upon which phase was CT metering .

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	O	×	×	×
1P3W	O	O	×	×
3P3W	×	×	O	×
3P4W	O	×	O	O

Example1:

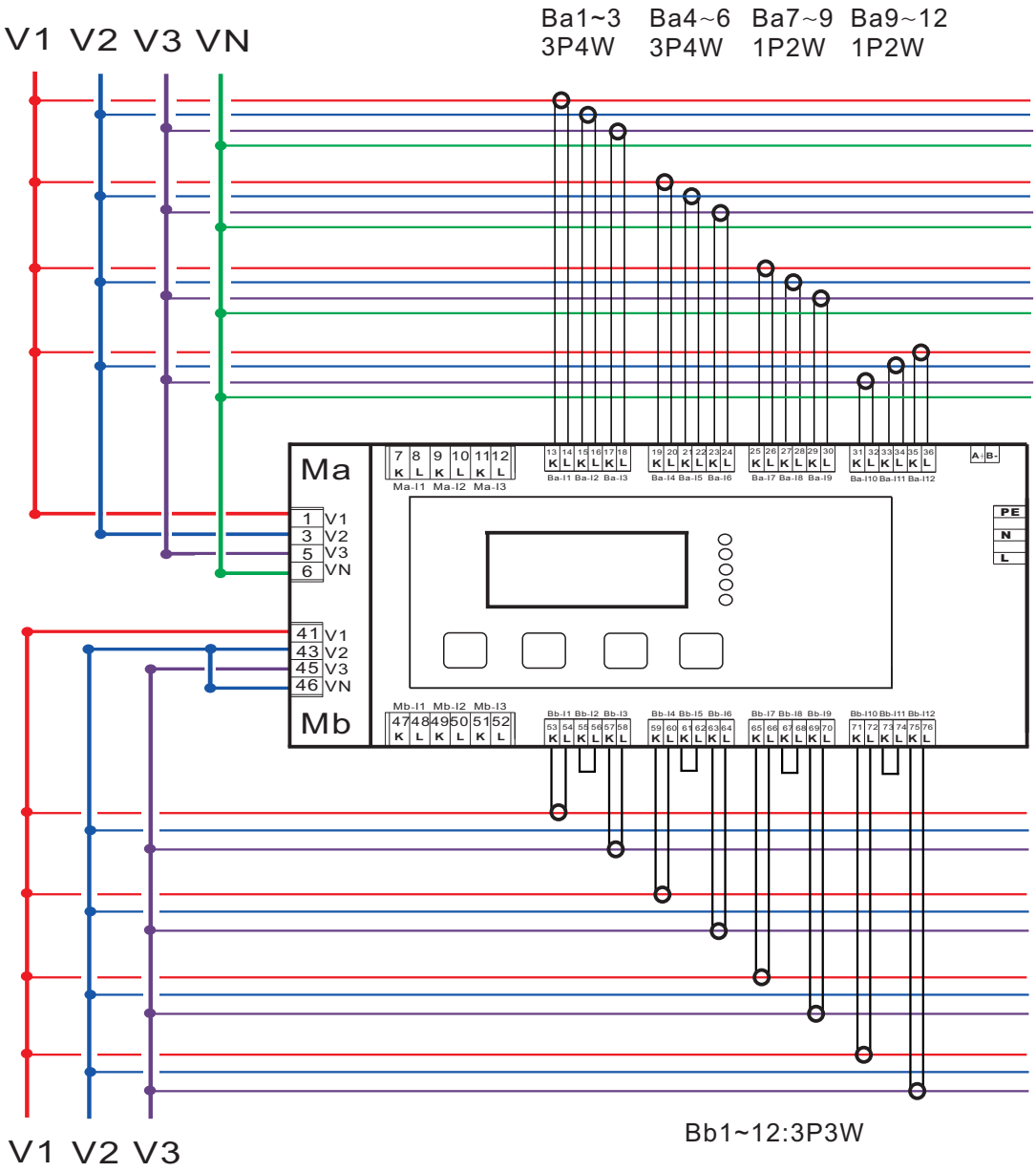
Main Circuit System Type: Ma=Mb=3P4W



Example2:

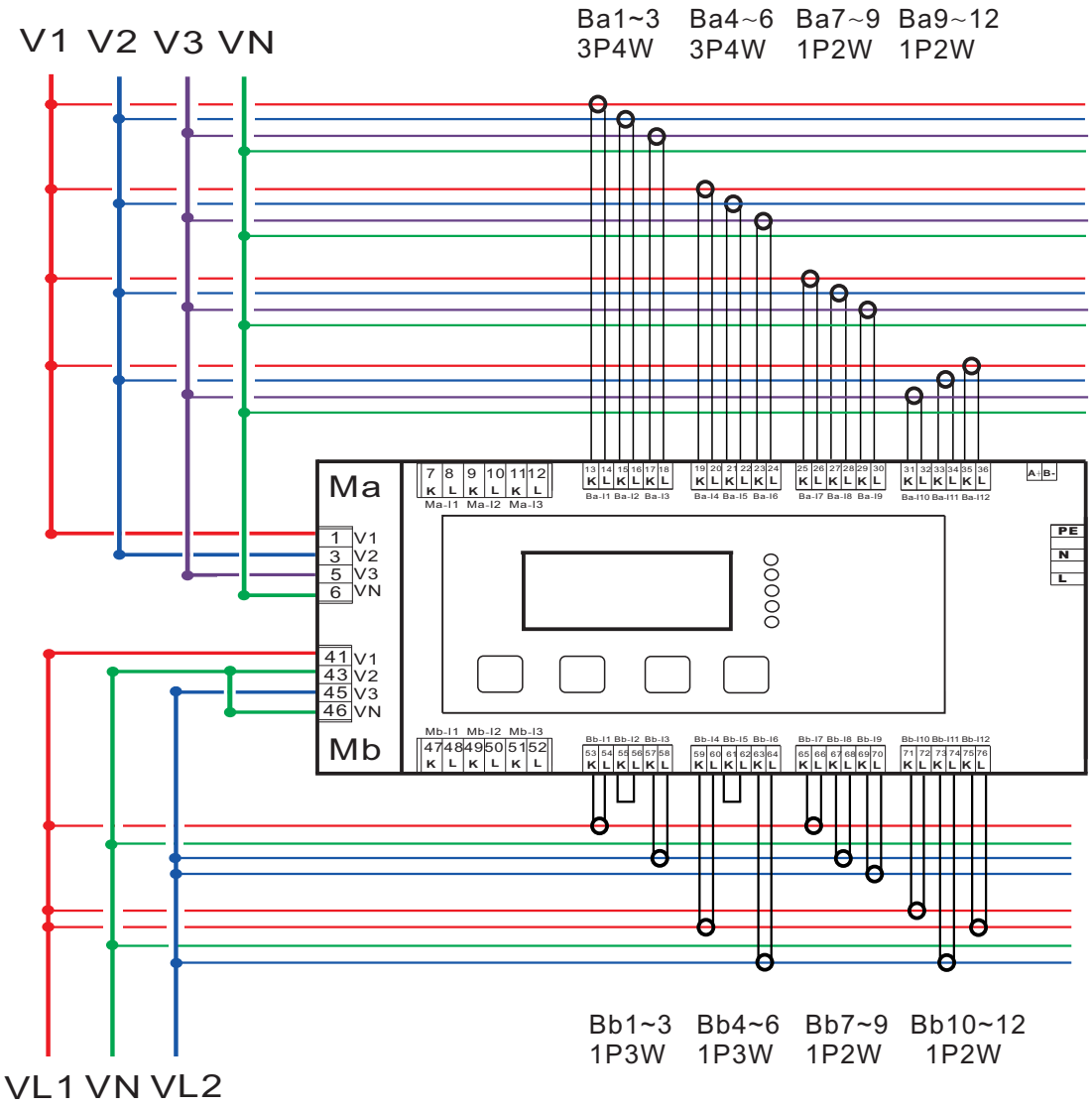
Main Circuit System Type :Ma=3P4W

Mb=3P3W



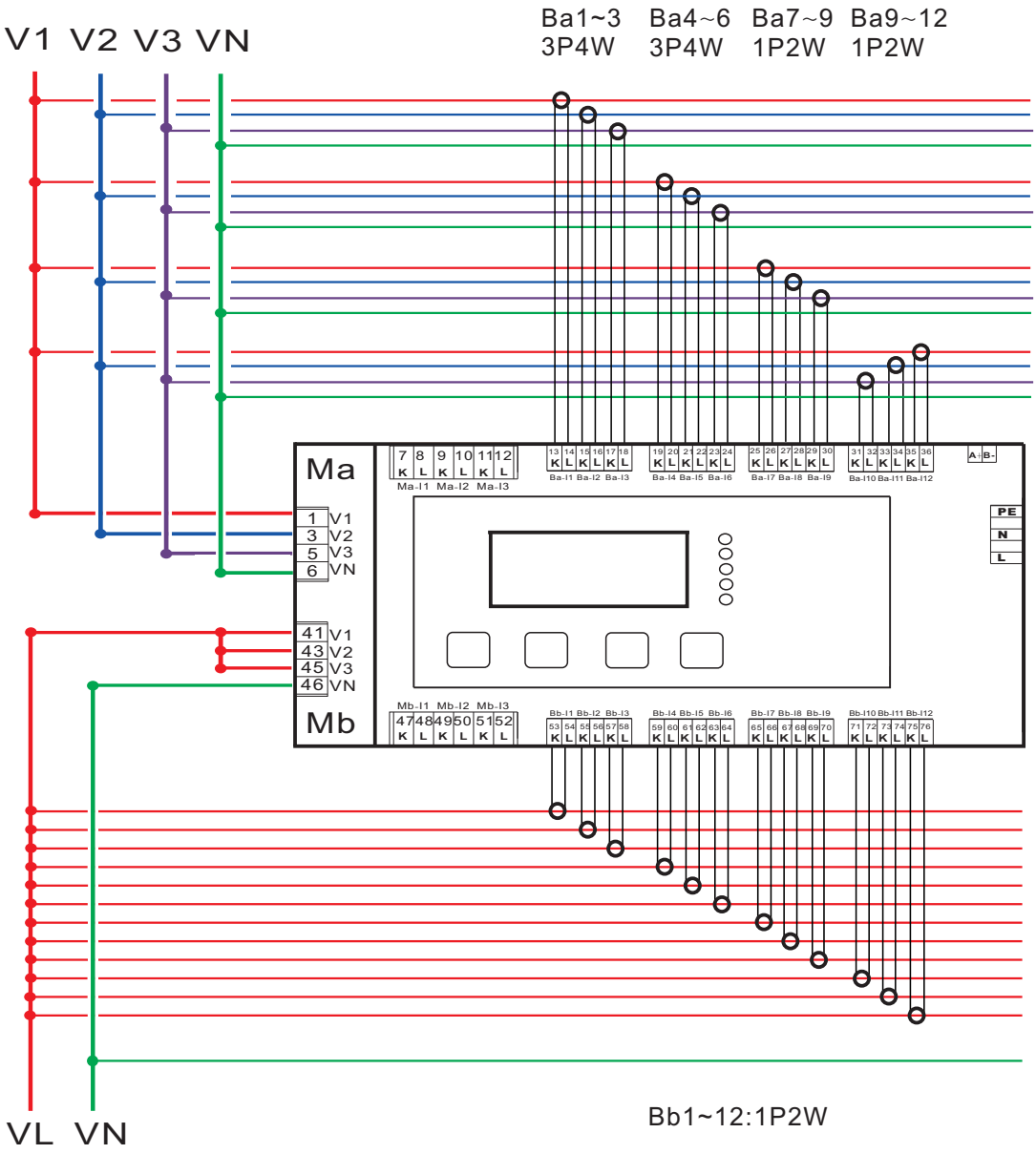
Example3:

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



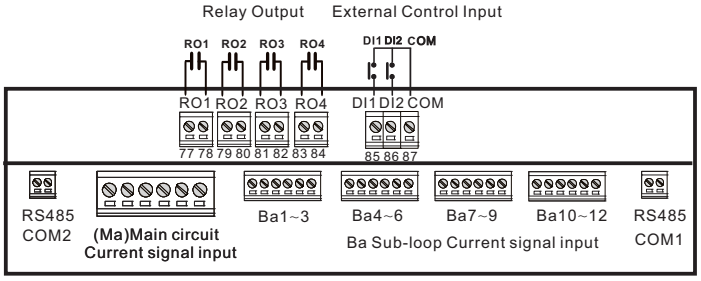
Example4:

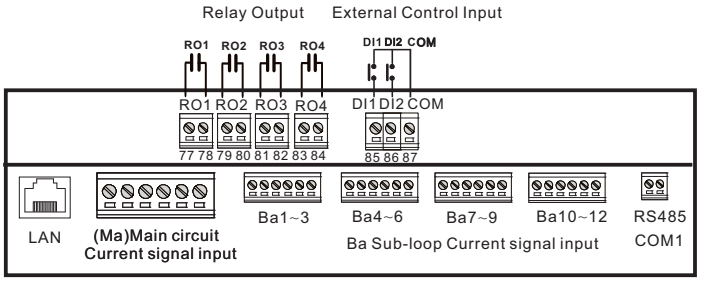
Main Circuit System Type: Ma=3P4W
Mb=1P2W



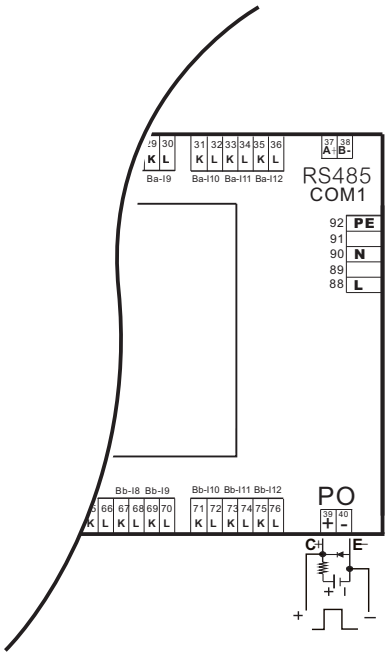
*When system type input is 1P2W , the main circuit system type setting should be set to 3P4W

Output & Input Connection

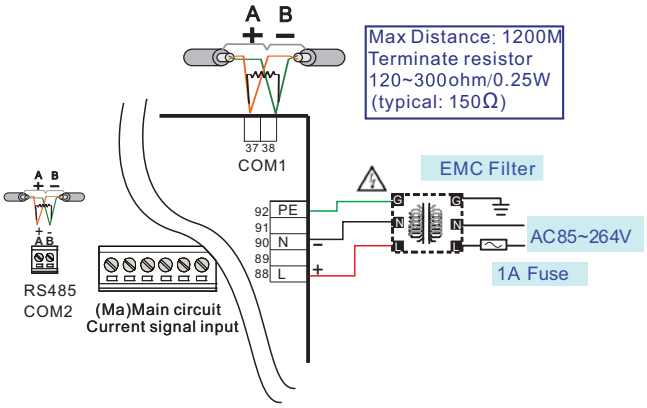




Digital Output Connection



Communication and Power Supply



Clamp CT Selection Guide

US-CTV – Hole Dimensions – Rated Current

CODE	Dimensions
10	Φ10
16	Φ16
24	Φ24
*35	Φ35

CODE	Primary Side
005A	5A
060A	60A
100A	100A
200A	200A
*300A	300A
*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-24-200A	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