ADP-30 Multifunction Power Analyzer

ADTEK

Description

ADP-30 series of multifunction power meters provide the power monitoring solution especially designed for users' requirement. This power meter combines advanced technology and diverse functions to provide comprehensive power monitoring and management.

With high accuracy measurement for single phase and three-phase system. Measuring parameters for voltage, current, power, power factor, frequency and energy, etc. So the user can control and get an overview of power usage status. Equipped with RS-485 Modbus RTU communication function to facilitate data exchange with other devices or systems to achieve intelligent monitoring and remote management.

In addition to displaying various power parameters, the power meter can also display accumulated electricity bills and CO_2 emissions, to help users consider energy consumption and environmental impact more comprehensively.

The ADP-30 series multi-function power meter is a powerful and flexible tool suitable for a variety of application scenarios, including commercial buildings, industrial plants and residential areas. It provides a full range of power management functions, allowing users to manage power resources more intelligently and energy-savingly.

Features

- Measuring 1P2W/1P3W/3P3W/3P4W system and the setting is programmable.
- Measuring balance unbalance loading system, including power parameters such as voltage, current, frequency, power factor, active power, reactive power, apparent power and energy.
- The number of sampling cycles is the number of cycles of the input frequency, and each cycle samples 128 points.
- CT input current can be set 1A or 5A by the user.
- the large-size, high-brightness LCD is easy and clear to read even under direct sunlight.
- Innovative meter AI calculation can perform automatic line adjustment and log it(See Note).
- Embedded 2MB non-volatile memory(NVM) which is with data and events recording function, can record for a long time.
- Ethernet Modbus TCP is optional for the second communication. And the dual-port design and daisy-chaining capability remove need for additional switches.
- Measuring voltage and current up to 31th individual harmonic, and can maintain power stabilty, and moreover, to avoid risk of equipment malfunctiion.
- Standard with time of use (TOU) function, which can perform power consumption with differential statistics according to the electricity consumption period.
- Standard with 2 sets of DI and 2 sets of DO, and is designed with a variety of I/O control functions to facilitate on-site monitoring and alarm needs.
- CE, and FCC approved.

Note: Auto wiring function is conditional, please refer to operation manual.

Applications

- Energy monitoring for motor control panel
- Energy monitoring for distribution board
- Energy management and power cost allocation
- Analysis of energy quality

Ordering Information

ADP-33 — Current Input | Voltage Input — 2nd Communication Option — AUX. Power

CODE		Input Range
A15		0~1A or 5A
	V6	20~400V L-N 35~690V L-L
OPTION 1		
MV		0~333mV, available for both Rogowski coil US-RC, and slipt core CT US-CTV

CODE	2nd Communication Option
N	None
OPTION 2	
E	Ethernet Modbus TCP
ED	Ethernet Modbus TCP Daisy Chain

CODE	Power Supply
ADH	AC/DC 90~240V(1A Fuse)
OPTION 3	
ADL	AC/DC 22~52V

Meter Guide

Measurement items and functions	
Voltage	Total and per phase L-L and L-N
Current	Total and per phase and neutral
Active Power	Four quadrants/per phase and active power total
Reactive Power	Four quadrants/per phase and reactive power total
Apparent Power	Total and per phase
Power Factor	Total and per phase
Frequency	Frequency
Active Energy	Import / Export / Total / Net
Reactive Energy	Import / Export / Total / Net
Apparent Energy	Total
THD/Voltage	Total and per phase
THD/Current	Total and per phase
Individual Harmonic	Current and voltage 2nd~31st individual harmonics
Phase Angle	Current and voltage
Three-phase Unbalance	Three-phase unbalance voltage / current
Demand	Current, active, reactive, apparent power
Max/Min Demand Record	Max Current, Max/Min power and time stamp
Max/Min Values	Parameter values and time stamp
Event Recording	Record the following parameter alarm events(up to 16 records): frequency, phase voltage, line voltage, current, active/reactive/apparent power, power factor, 3-phase total active/reactive/apparent power, power factor, active/reactive/apparent power demand, current demand, voltage/current unbalance
Data Logging	With a 2MB memory capacity and a setting of "10 data points recorded per minute, each data point being 4 bytes", data can be recorded continuously for 28 days, storing a total of 40,300 records. The following parameters can be set to logging: frequency, phase voltage, line voltage, current, active/reactive/apparent power, power factor, active/reactive/apparent energy, voltage THD and max/min values, current THD and max/min values, active/reactive/apparent power demand and max/min values, current demand and max values
1st Communication Port	RS-485 Modbus RTU
2nd Communication Port (Optional)	Single or dual port(Daisy chain) Ethernet Modbus TCP
Digital Input	DI1, DI2
Digital Output	DO1, DO2
Time of Use	4 time zones, 8 periods, 4 tariff
Date and Time	Year, Month, Day, Hour, Minute, Second
Run hour	Operating hours, Running hours
CO_2 Emission	Total CO_2 weight of energy(Kg)
Cost	Total cost of energy

Accuracy & Resolutions

Parameter	Accuracy	Resolution	Measurement Range
Voltage	0.2%	0.1V	20~400V L-N / 35~690V L-L
Current	0.2%	0.001A	1%~120% CT rating current
Neutral Current	1.0%	0.001A	1%~120% CT rating current
Active Power	0.5%	1W	-999,999,999~999,999,999W
Reactive Power	0.5%	1Var	-999,999,999~999,999,999Var
Apparent Power	0.5%	1VA	0~999,999,999VA
Power Factor	0.5%	0.001	-0.020~+1.000~0.020 for 4 quadrants
Frequency	0.05%	0.01Hz	45.00~65.00Hz
Active Energy	Class0.5S	0.1kWh	0~99,999,999.9kWh
Reactive Energy	0.5%	0.1kVarh	0~99,999,999.9kVarh
Apparent Energy	0.5%	0.1kVAh	0~99,999,999.9kVAh
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%
Voltage & Current Phase Angle	1.0%	0.1°	0.0°~359.9°
Current demand	0.2%	0.001A	0.000~9,999A
Active Power demand	0.5%	1W	-999,999,999~999,999,999W
Reactive Power demand	0.5%	1Var	-999,999,999~999,999,999Var
Apparent Power demand	0.5%	1VA	0~999,999,999VA

Technical Specification

Electrical Characteristics

Measurement: True RMS measurement
Sampling: 128 point/cycle
Display refresh rate: 0.5s
Metering system: 1P2W, 1P3W, 3P3W, (1/2/3CT), 3P4W(1/3CT)Balance/Unbalance
Input range: Voltage：20~400 VLN ; 35~690VLL
PT primary ratio: 100~1,200,000V
PT secondary ratio: 50~600V
Current: 1A / 5A / 333mV
CT primary ratio：1~9999A
CT secondary ratio：1A / 5A / 333mV
Overload capacity: Current: 2x rated continuous ; 20x rated / 1s
Input burden: Voltage:<0.2VA ; Current:<0.1VA

Power Quality

THD: Total harmonic distortion for voltage and current
Individual harmonic: 2nd~31st individual harmonics for voltage and current and odd, even harmonic content
The display can be switched to display the odd harmonic content of the 3rd to 15th of voltage and current
Unbalance: 3-phase voltage and current

Demand

Calculation method: Block / Sliding
Period: 1~60 min
Demand record: Records of Max/Min value and time stamp

TOU (Time of Use)

4 time zones: 1~4 zones per year
8 periods: Each time zone can set 1~8 periods
The sharp, peak, valley and normal tariff can be specified for each period
Parameters of TOU: Cumulative value of import and export active energy, import and export reactive energy, total apparent energy for each tariff of previous and current month; and maximum current and power demand of each tariff for current month
Holiday setting: The date and timetable of holiday for five years can be set individually or set on the same holiday for five years

Data Log

Log setting: The specified parameters can be recorded according to the set interval time, the interval time can be set from 1 to 32767, and the interval time unit can be set as day, hour, minute, second
With a 2MB memory capacity and a setting of "10 data points recorded per minute, each data point being 4 bytes", data can be recorded continuously for 28 days, storing a total of 40,300 records.
Event recording: The event and time when an exception occurs can be recorded (up to 16 records)
Memory storage: 32KB FRAM & 2MB Flash, no battery life issue

RS-485 Communication

Protocol: Modbus RTU mode
Address: 1~247
Baud rate: 1200/2400/4800/9600/19200/38400/57600/115200 bps
Parity: None / Even / Odd
Data bits: 8 bits
Stop bit: 1 or 2
Distance: 1200M max

Ethernet (Optional)

Interface: Single or dual port, 10/100M BASE-TX, RJ45 connector
Dual-port structure: Daisy-chaining capability
Protocol: Modbus TCP
TCP socket: 4 sockets

Digital Input

Input capacity: 2 channels DI input, mechanical contact or open collector input are available
Function mode: Can be set to reset active energy / reset reactive energy / reset accumulative total / reset Max. & Min. value / reset alarm output / reset demand / reset Max. demand / DI function

Digital Output (DO)

Output capacity: Open collector(O.C.), 30Vdc, 30mA(max)
Function: Can be set to energy pulse output, alarm output, remote output
Energy pulse output: DO1 & DO2 could be set for different energy pulse output application
Pulse divider: 1~9999
(1 Pulse= 0.1kWh, if set 100, 1 Pulse= 10.0kWh)

Pulse high width: 1~5000ms, 0 is 50% duty cycle
Alarm output mode: Hi / Lo
Up to 37 parameters of power and demand for assign
Test pulse output: 3200 Pulse /1kWh, Duty cycle 50%

Power Supply

Range: ADH : AC/DC 90~240V(1A Fuse)
ADL: AC/DC 22~52V
Power consumption: AC : ≤ 10VA @ 230V / DC : ≤ 3W

Environmental Conditions

Operating Temp.: 0~60 ℃
Humidity rating: 5~95 %RH, Non-condensing
Temp. coefficient: ≤100 PPM/℃
Storage Temp.: -10~70 ℃
Degree of protection: Front panel: IP50 ; Housing: IP20
Operating altitude(maximum): 2000m above sea-level

Mechanical Structure

Dimensions: 96mm(W) x 96mm(H) x70.5mm(L)
Panel cutout: 90.8mm(W) x 90.8mm(H)
Material: ABS, Black (with fire-retardant)
Mounting: Panel mounting
Weight: ≤400g
Wire terminal: PA 66 (UL 94V-0)
Voltage / Current input:
AWG: 26~10 / 0.5~4.0mm2
Screw Torque Value: M3 / 8.0kgf.cm(Max)
Others input:
AWG: 28~16 / 0.5~1.5mm2
Screw Torque Value: M2 / 2.04kgf.cm(Max)

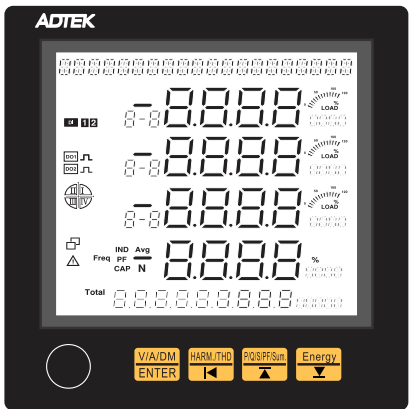
Safety

Isolation: AC 2.5KV, 50/60Hz, for 1 min,
between Power / Input / Output / Case
(Ethernet: AC 2.0kV)
Surge immunity: AC±4kV, 1.2 / 50us
voltage input / current input / AUX. power
Insulation resistance: ≥100MΩ @ 500Vdc
EMC: EN IEC 61326-1:2021
EN 55011:2016/A2:2021
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021
IEC 61000-4-2:2008
IEC 61000-4-3:2020
IEC 61000-4-4:2012
IEC 61000-4-5:2014/A1:2017
IEC 61000-4-6:2013/COR1:2015
IEC 61000-4-8:2009
IEC 61000-4-11:2020/COR1:2020
Safety(LVD): EN 61010-1:2010/A1:2019/AC:2019-04
FCC: FCC 47 CFR part 15 subpart B Class A
Voltage and current measurement category:
CAT III up to 300 V L-L
CAT II up to 600 V L-L
AUX. power category: CAT III up to 300 V L-N

Accuracy of Standard

Active energy: Class 0.5S (IEC62053-22:2003)
Reactive energy: Class 1.0 (IEC62053-24:2003)

Front Panel



Display: LCD 65(W)x61(H)mm; White back light blue words visible.
Backlight: 1~15 min, or light could be set as always on
Description: Twenty digits in the top of display:
Display parameter name.

Four line of 8 digits in the metering area:
Display metering data such as voltage, current, power, power factor, frequency, unbalance, etc.

Four line of digits in the metering area:
Display metering data unit.

Three line 8-8: 1, 2, 3 for 3 phase; 1-2, 2-3, 3-1 for 3 phase line to line.

Nine 8 and five digits:
Display energy value and unit. Also display date and time.

Display 5 power parameters at the same time

Bar Graph indicates load percentage

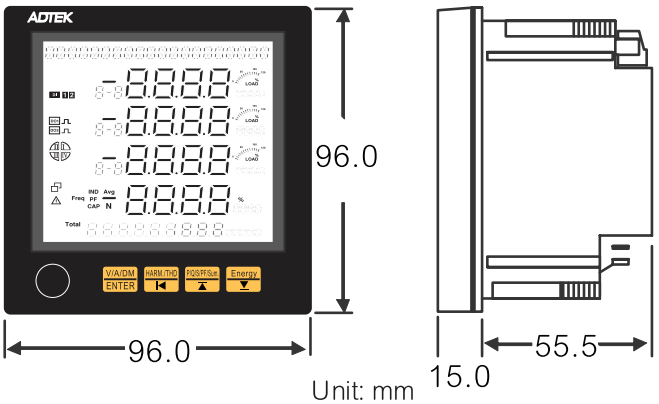
Display perpetual calendar date and time

IND & CAP load type display

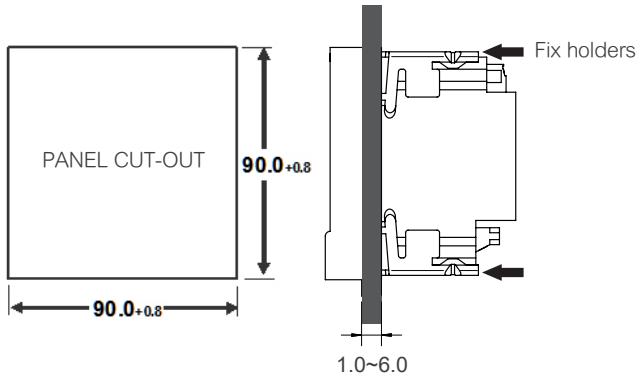
Load quadrant display

7 kinds of summary pages for home page could be set according to user needs

Dimensions

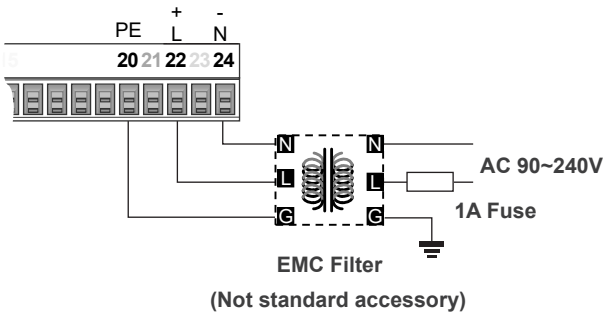


Installation

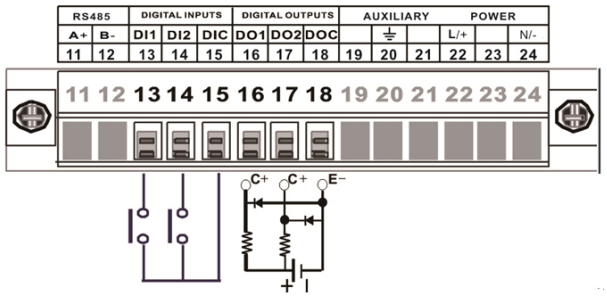


Unit:mm

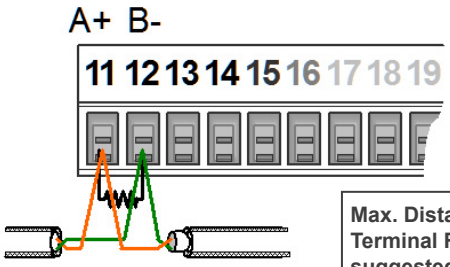
Power Connection



Digital Input/Output



RS-485 Communication Port

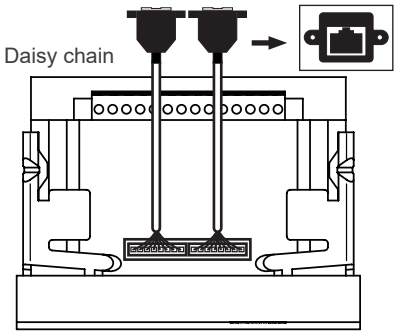


Max. Distance: 1200M
Terminal Resistors suggested :120Ω/0.5W
(Not standard accessory)

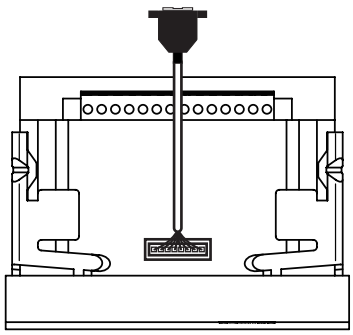
Ethernet Port

Dual port

RJ45 cable（Total length 30cm）



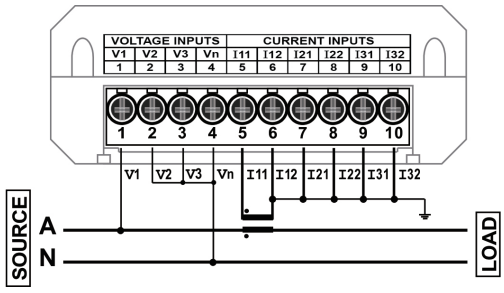
Single port



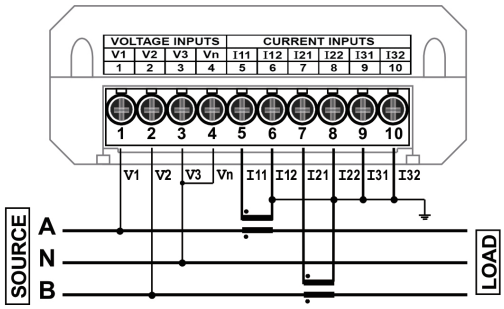
Voltage and Current Wiring

CT secondary side distinguishes 1A/5A and 333mV, the mV of CT signal needs to be wired independently, and cannot be grounded or connected together with each other.

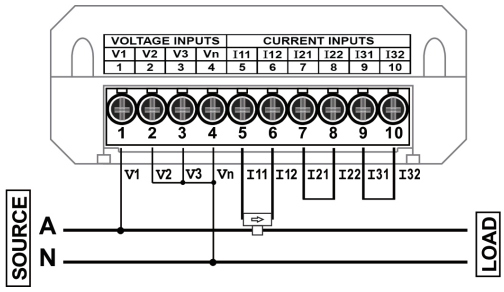
1P2W(1A/5A)



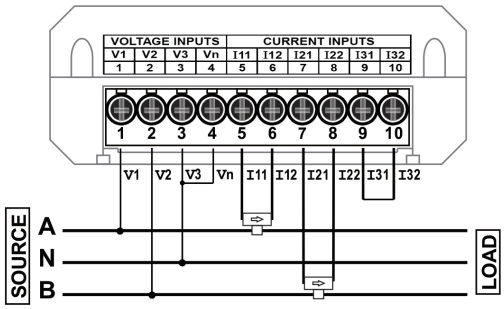
1P3W(1A/5A)



1P2W(333mV)

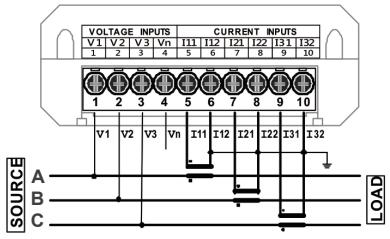


1P3W(333mV)

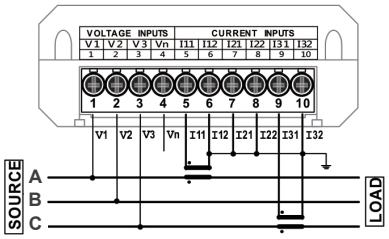


3P3W w/o PT

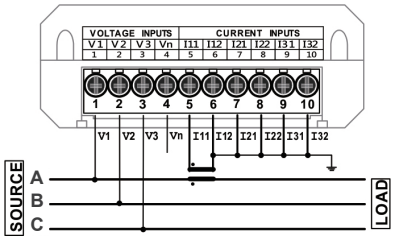
3CT(1A/5A)



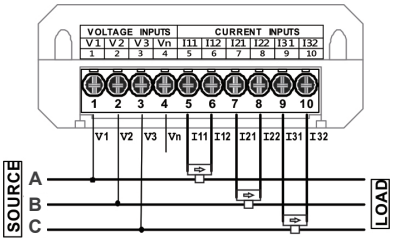
2CT(1A/5A)



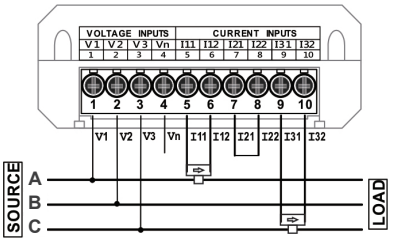
1CT(1A/5A)



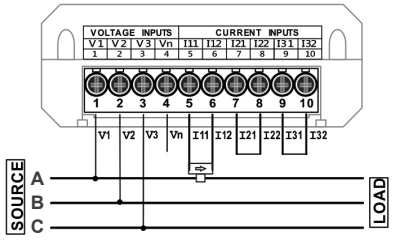
3CT(333mV)



2CT(333mV)

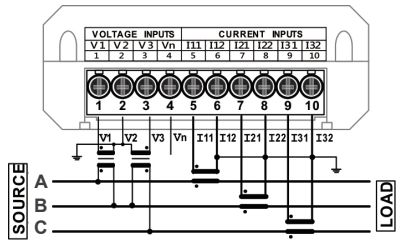


1CT(333mV)

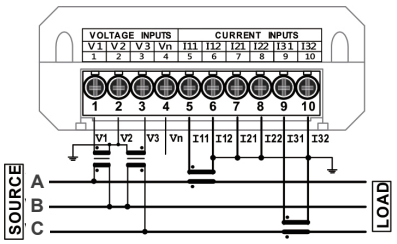


3P3W 2PT

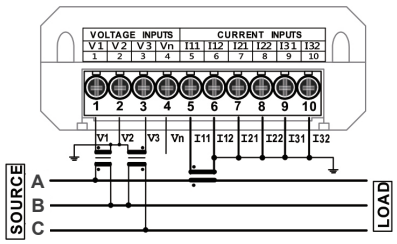
3CT(1A/5A)



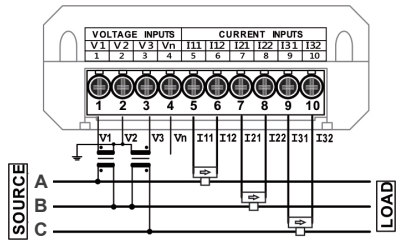
2CT(1A/5A)



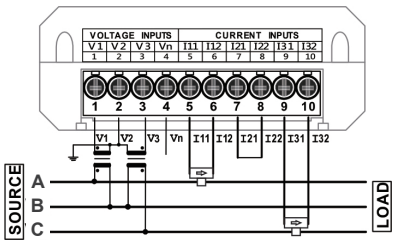
1CT(1A/5A)



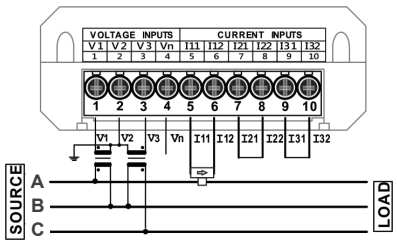
3CT(333mV)



2CT(333mV)

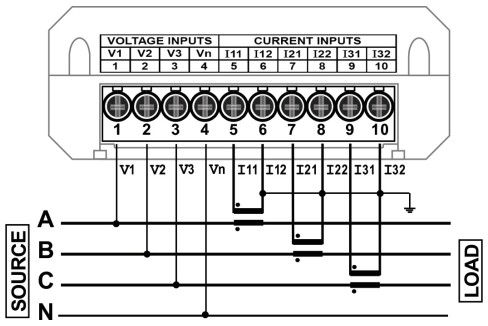


1CT(333mV)

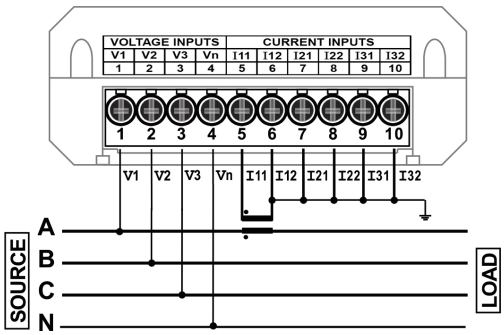


3P4W w/o PT

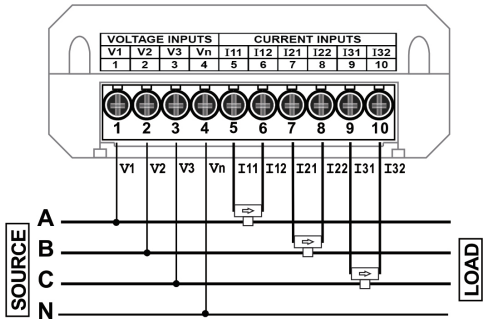
3CT(1A/5A)



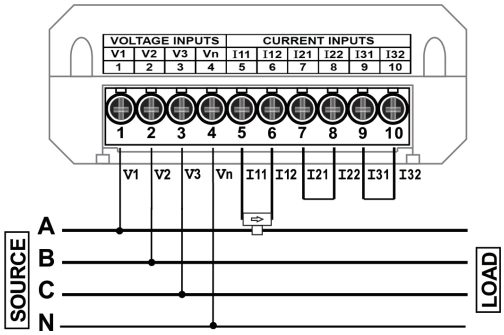
1CT(1A/5A)



3CT(333mV)

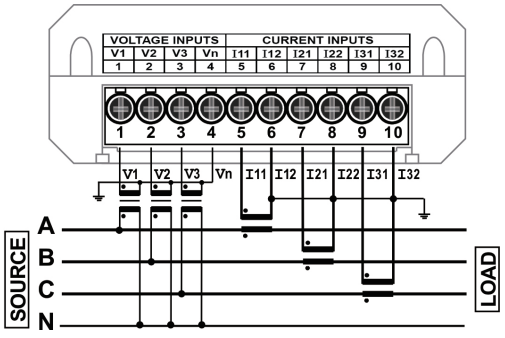


1CT(333mV)

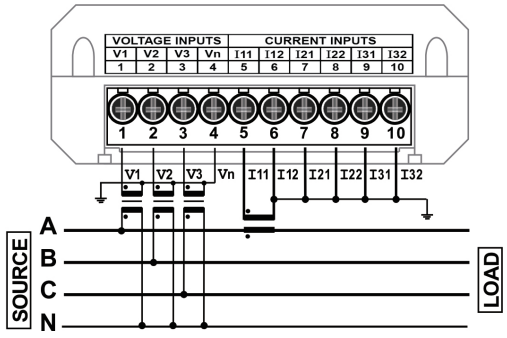


3P4W 3PT

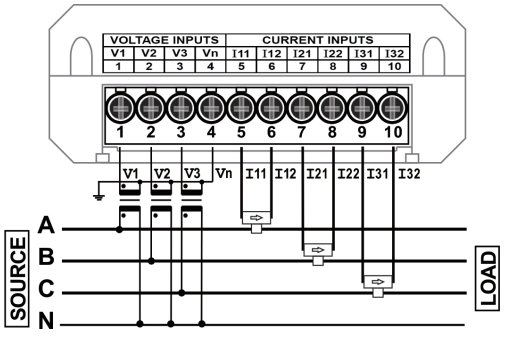
3CT(1A/5A)



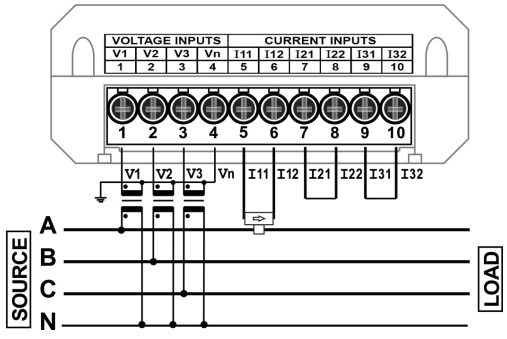
1CT(1A/5A)



3CT(333mV)



1CT(333mV)



Split Core CT Ordering Information

(The output line of mV on the secondary side of the CT needs to be wired independently, and cannot be connected together or grounded for protection purposes.)

US – CTV — Hole — Primary Current — **2** — Cable Option

CODE	Diameter(mm)	CODE	Rated Current
10	Φ10	005	5A
16	Φ16	060	60A
		100	100A
		150	150A
24	Φ24	200	200A
35	Φ35	300	300A
		400	400A
		600	600A
50	Φ50	800	800A

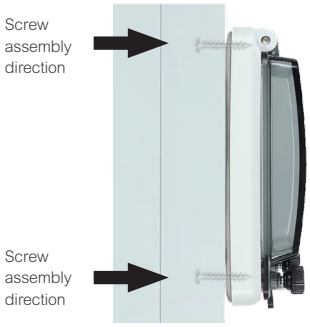
CODE	Cable Spec.
LSFH	Low smoke zero halogen
This code is not filled when there is no optional function	

Type	Current of primary (A)	Voltage of secondary (mV)	Accuracy %F.S.	Weight
US-CTV-10-005	5A	333	1.0	60g
US-CTV-16-060	60A	333	0.5	100g
US-CTV-16-100	100A	333	0.5	100g
US-CTV-16-150	150A	333	0.5	100g
US-CTV-24-200	200A	333	0.5	205g
US-CTV-35-300	300A	333	0.5	375g
US-CTV-35-400	400A	333	0.5	375g
US-CTV-35-600	600A	333	0.5	375g
US-CTV-50-800	800A	333	0.5	655g

Meter Screen Protection Cover (Optional)

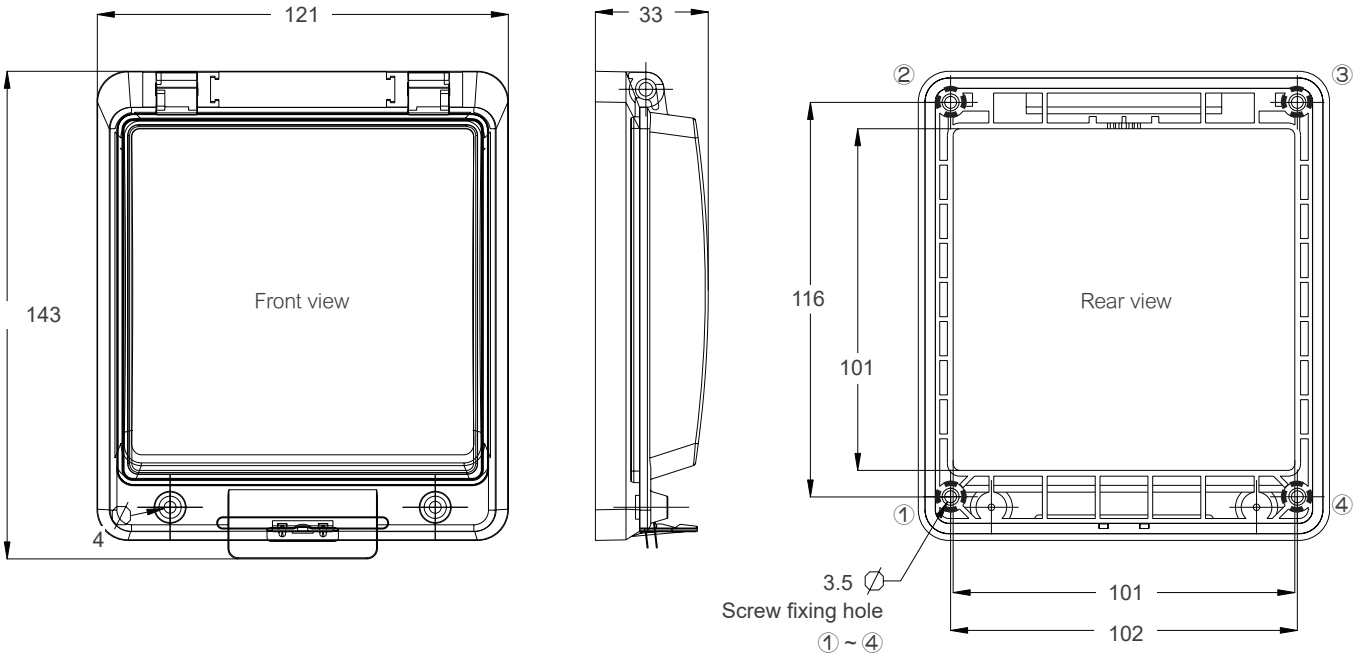
Model: **U – COV – K100A**

Function: To upgrade the protection degree to IP67
Material: PC and foaming material
Dimensions: Square shape, 143 x 121 x 33mm
Installation: Secure the protective cover with 4 screws from the rear of the mounting board.



(This is an assembly diagram. Please order the meter separately.)

Dimensions



(Unit: mm)