CPM-20 Multifunction Power Meter

ADTEK

Description

CPM-20 multifunction power meter provide high accuracy single phase and three-phase measuring and displaying, energy accumulating, power quality analysis, and data communication.
It provides maximum/minimum records for power usage and power demand parameters.
Hardware standard built in a RS485 Modbus communication port.
FCC and CE Approved

Applications

- Energy management system
- Factory automation
- Intelligent power panel
- Industrial automation
- Power Grid automation
- Community power monitoring
- Intelligent green building

Ordering Information

CPM — Model — A Input Range / V Input Range — AUX.Power

CODE	Function
20	Standard
21	Demand、Digital input / output Max/Min Values and record

CODE		Input Range
A1		0~1A
A5		0~5A
	V6	40~600V

CODE	Power Supply
ADH	AC 85~264V DC100~300V
ADL	AC/DC 20~56V

Meter Selection Guide

Features		CPM-20	CPM-21
Voltage	V_{12} V_{23} V_{31} V_{LL_Avg} / V_1 V_2 V_3 V_{LN_Avg}	●	●
Current	I_1 I_2 I_3 I_{Avg} I_N	●	●
Active Power	P_1 P_2 P_3 ΣP	●	●
Reactive Power	Q_1 Q_2 Q_3 ΣQ	●	●
Apparent Power	S_1 S_2 S_3 ΣS	●	●
Power Factor	PF_1 PF_2 PF_3 PF_{Avg}	●	●
Frequency	Hz	●	●
Active Energy	Wh Total	●	●
Reactive Energy	Varh Total	●	●
THD/Voltage	THD_{V1} THD_{V2} THD_{V3} THD_{V_Avg}	●	●
THD/Current	THD_{I1} THD_{I2} THD_{I3} THD_{I_Avg}	●	●
RS485	Modbus RTU mode	●	●
Cost	Total cost of energy	●	●
CO2	Total CO_2 weight of energy	●	●
Date	Year, Month, Day, Hour, Minute, Second	●	●
DI & DO	Digital input / output function		●
Demand	ΣP ΣQ ΣS IAvg		●
Max/Min Values and record	U_A U_B U_C U_{BC} U_{AB} U_{CA} I_A I_B I_C P_{SUM} Q_{SUM} S_{SUM} PF_{avg} FREQ P_{md} Q_{md} S_{md}		●

Accuracy & Resolutions

PARAMETER	ACCURACY	RESOLUTION	MEASUREMENT RANGE
Voltage	0.25%	0.1V	40.0~400.0V_{ac}(V_{LN})
Current	0.25%	0.001A	1%~120% CT rating current
Neutral Current	1.0%	0.001A	1%~120% CT rating current
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	0.2%	0.01Hz	45.00~65.00Hz
Active Energy	0.5%	0.1kWh	0~99999999.9kWh
Reactive Energy	0.5%	0.1kVarh	0~99999999.9kVarh
THD	1.0%	0.1%	0~100.0%

Technical Specification

Electrical Characteristics

Measurement: True RMS
Sampling: 128 point/Cycle
Metering system type: 1P2W, 1P3W, 3P3W(2、3CT)、3P4W (1、3CT) ; Balance / Unbalance
Input range: Voltage:40~400V_{LN} ; 60~600V_{LL}
PT Primary side ratio: 100~500000V
PT Secondary side ratio:100~600V
Current:0~5A, (Optional:0~1A)
CT Primary side ratio: 5~9999A
Frequency:45~65Hz
Metering over range: Voltage:2x rated voltage continuous ; 2500V,1sec
Current:2x rated current continuous ; 20x rated current 1sec
Input load: Voltage:<0.2VA ; Current:<0.1VA

Power Quality

THD: Total harmonic distortion for voltage and current

RS485 communication

Protocol: RS485 Modbus RTU mode
Address: 1~247
Baud rate: 1200/2400/4800/9600/19200/38400 bps
Parity: None / Even / Odd
Data bits: 8 bits
Stop bit: 1 or 2
Distance: 1200M max
Terminate resistor: 120~300Ω/0.25W(typical: 150Ω)

Memory storage: FRAM

(CPM-21 only)

Digital input: 2 channels DI
Opto-coupler input: 5V_{dc}, 20mA
Response time:≤300mS
Isolation: 2000Vac
Digital output: 2 channels DO
Open collect(O.C.); 40V_{dc} , 50mA
Response time: ≤300mS
Isolation: 2000Vac
Function: Can set to energy pulse output 、alarm output 、RS485 control output
Energy pulse output: DO1 is active energy pulse output
DO2 is reactive energy pulse output
Pulse divider: 1~6000 (x0.1 kWh or kVarh)
Pulse width: 1~20 (x10mS)
Alarm output mode: Hi / Lo
Up to 33 parameters of power and Demand for assign
RS485 control output mode: Output setting from RS485

Power Supply

Range: ADH:AC 85~264V / DC 100~300V
Power consumption: AC:≤10VA @ 230V / DC:≤3W

Environmental Characteristics

Operating Temp.:	0~60℃
Humidity rating:	5~95%RH, Non-condensing
Temp. coefficient:	≤100 PPM/℃
Storage Temp.:	-10~70℃
IP Enclosure:	Front panel: IEC 529 (IP50) ; Housing: Ip20

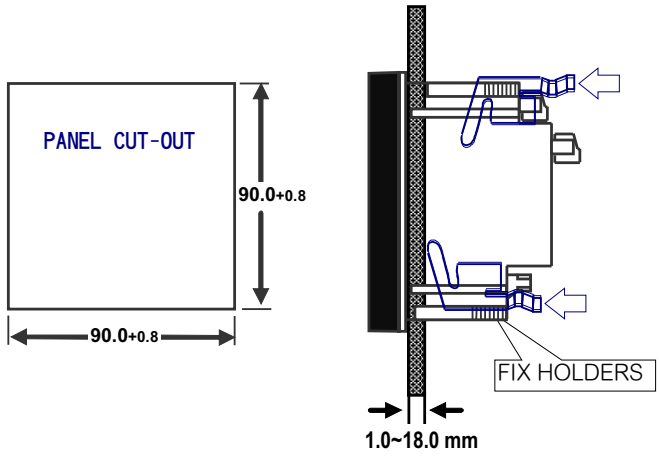
Mechanical Characteristics

Dimensions:	96mm(W)x96mm(H)x71mm(L)
Panel cutout:	90mm(W)X90mm(H)
Material:	PC, Black (with fire-retardant)
Mounting:	Panel mounting
Weight:	≤400g

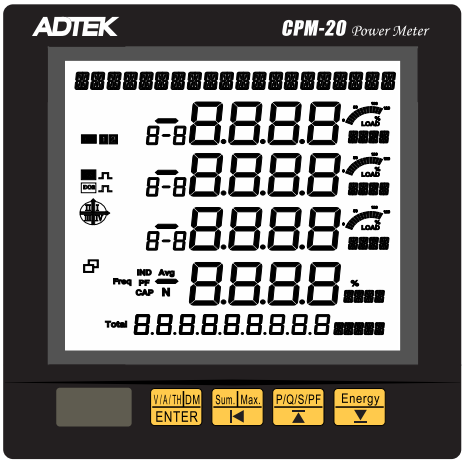
Safety

Isolation:	AC 2KV,50/60Hz,for 1 min, Between Power / Input / Output / Case
Insulation resistance:	≧100MΩ @ 500Vdc
EMC:	EN61326:2006
LVD:	EN61010-1:2010
Wire terminal:	PA66 (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 Toque Value: M2 / 2.04kgf.cm(Max)

Installation



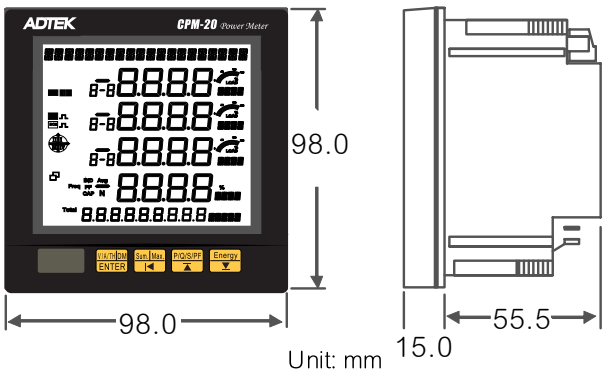
Front panel



Display: LCD 65(W)x61(H)mm ; White backlight
Backlight delay time : 0~15 min ("0" is always on)

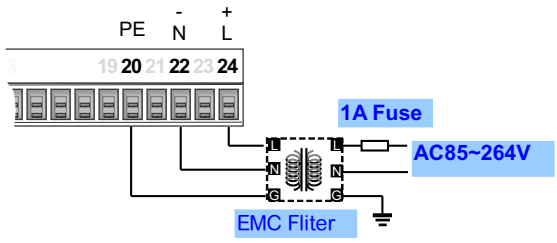
Description: Twenty 14-segment digits in the top of display area: Display mode indication.
Four line of 8 digits in the metering area : Display metering data such as voltage、current、power、power factor、frequency、unbalance、etc.
Four line of 14-segment digits in the metering area :Display metering data unit.
Three line 8-8 digits:1, 2, 3 for 3 phase ;1-2, 2-3, 3-1 for 3 phase line to line.
Nine 8 and five 14-segment digits:Display energy data and unit.
Also display real time o'clock.

Dimensions



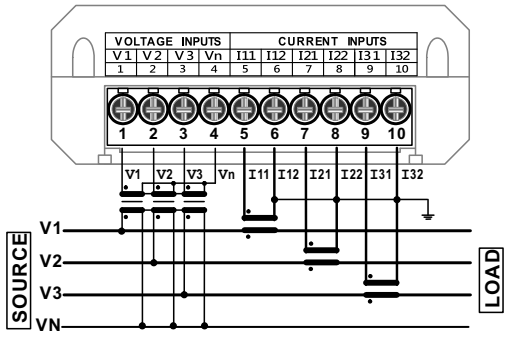
Connection diagram

Aux Power

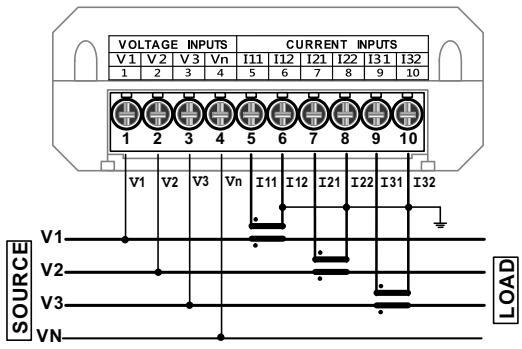


Voltage and Current input

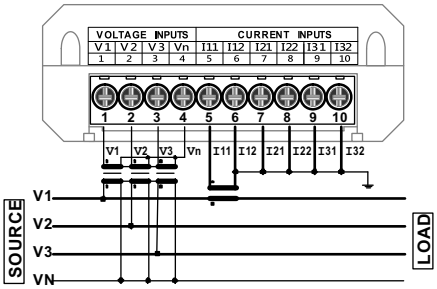
3P4W- 3PT/ 3CT



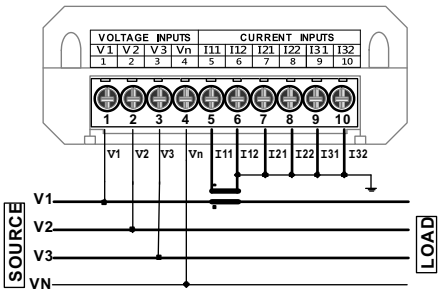
3P4W- w/o PT/ 3CT



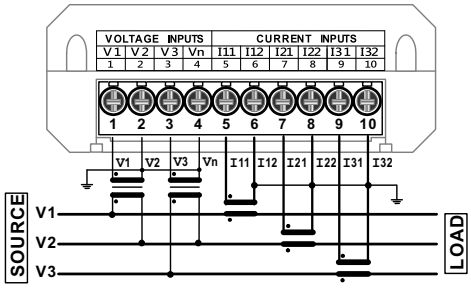
3P4W-3PT/ 1CT



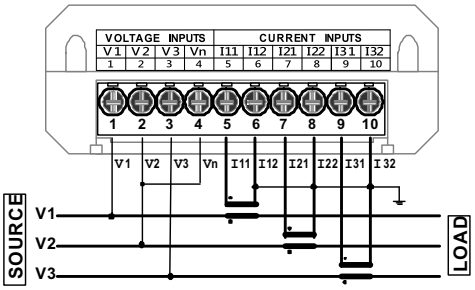
3P4W-w/o PT/ 1CT



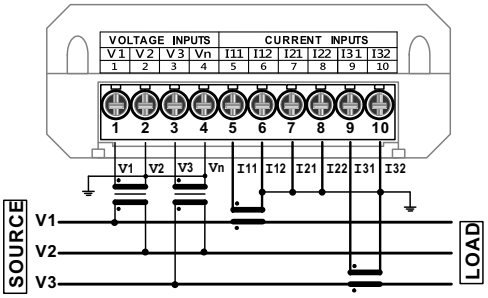
3P3W-2PT/ 3CT



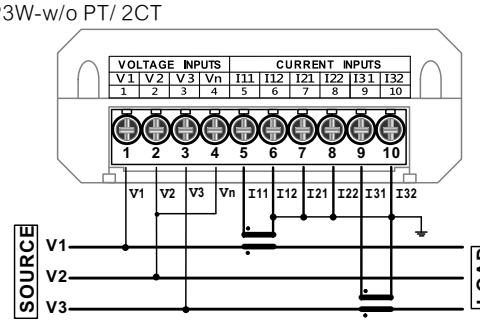
3P3W-w/o PT/ 3CT



3P3W-2PT/ 2CT

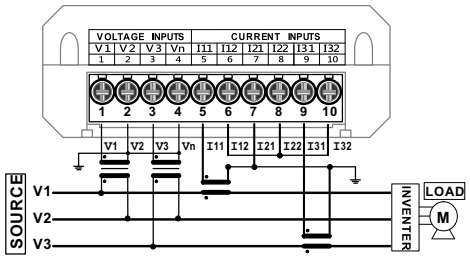


3P3W-w/o PT/ 2CT

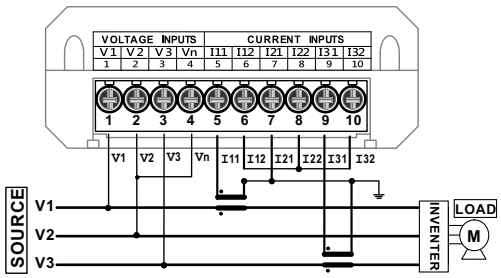


※This CT connection is available use for Inverter load or normal load situation

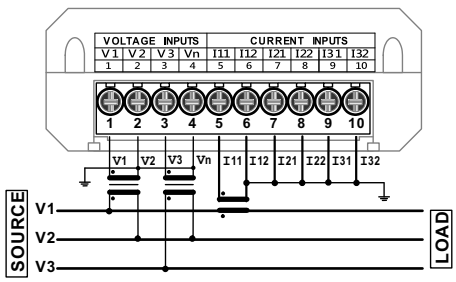
3P3W-2PT/ 2CT



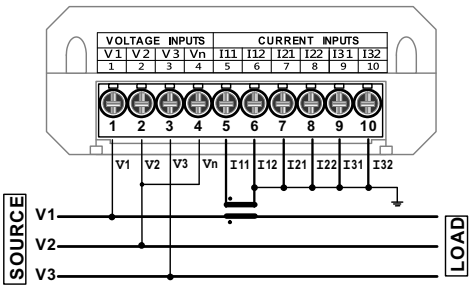
3P3W-w/o PT/ 2CT



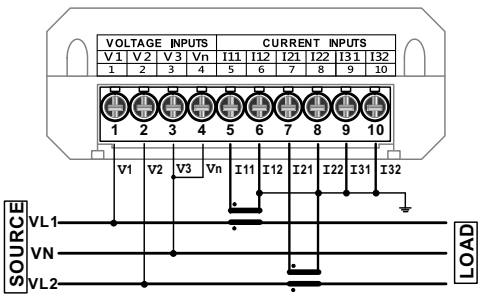
3P3W-2PT/ 1CT



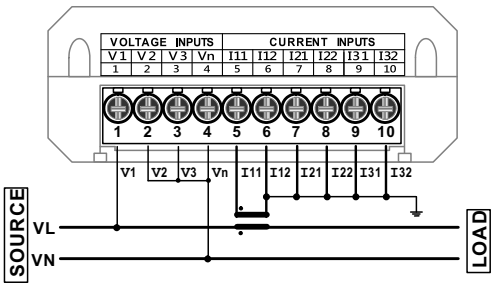
3P3W-w/o PT/ 1CT



1P3W

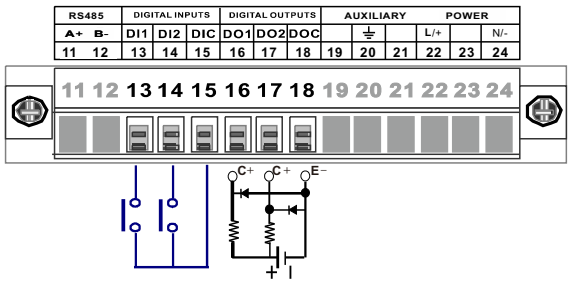


1P2W



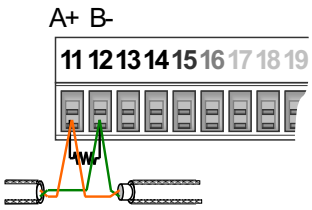
Digital input/output (CPM-21 only)

Wire: AWG 28~16 (0.5~1.5mm²)



RS485 Communication port

Wire: AWG 28~16(0.5~1.5mm²)



Distance Max. : 1200M
Terminator : 120~300Ω/0. 25W
(Standard: 150Ω)