

# MULTI-FUNCTION POWER METERS

## *Smart Energy Analyzers*

for Monitoring of Electrical Parameters  
in Single-Phase & 3-Phase Systems

**CMFM-F & CMFM-G**



### Introduction

Multi-Function Power Meters CMFM Series are high-speed multi-purpose energy analyzers. These smart power analyzers have a sampling rate of 128 samples per cycle and can accurately measure and display multiple parameters for 1P2W, 1P3W, 3P3W and 3P4W power systems. Suited for the monitoring of power consumption in distribution panels, these multi-function power meters are also used for the power management and power quality analysis in factories, office buildings, and residential towers.

Equipped with a built-in RS-485 communication interface, Multi-Function Power Meters CMFM Series communicate via the Modbus RTU protocol with a maximum baud rate of 38,400 bps. These intelligent panel meters support the remote monitoring of various types of SCADA (supervisory control and data acquisition) and energy management systems. Where the system voltage exceeds 600V or when the current is over 5A, the use of a voltage transformer or current transformer will enable the power meter to be used in HV or LV power systems alike for real-time monitoring of electrical parameters.

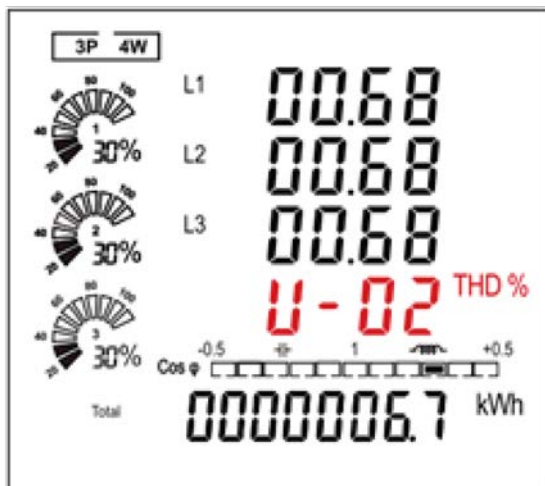
### Features

- RoHs & CE Certified.
- Measurement of multiple parameters.
- Bi-directional measurement IMP & EXP.
- Display of energy information for each phase.
- Up to 63rd THD and IHD.
- 1A / 5A CT / PT programmable.
- Bar graphs for power indication, ideal for real-time monitoring of electrical parameters and power quality analysis.
- Backlit LCD display with full viewing angles.
- Setting of parameters can be performed manually through the front panel.
- Measure and display of multiple parameters, including V, A, W, VAR, VA, kWh, kVARh, Hz, PF, THD, IHD, Max. DMD, etc.

## Additional Features [CMFM-G only]

- Digital Input & Output (4\*DI / 2\*DO). (DO can be connected to an alarm device.)
- Providing SOE (sequence of events) records. 30 events can be saved. Recorded events include the following: Primary Power Down, Primary Power Up, CT2 Changed, CT1 Changed, PT2 Changed, PT1 Changed, Energy Reset, Demand Reset, Alarm Occurrence, etc.
- Supporting TOU (time-of-use) tariff, designating up to 8 different time segments and 4 different rates.

## Data Display Examples



Harmonic Distortion of Voltage



Harmonic Distortion of Current

## Specifications, Measured Range, and Operating Environment

Standard	IEC 62053-22
Nominal Input Voltage	50 ~ 600V AC (L-L)
Aux. Power Supply	85 ~ 275V AC / 120 ~ 380V DC
Nominal Input Current	1A or 5A
Frequency	45 ~ 65 Hz
Short-Time Overcurrent	20 I <sub>max</sub> for 0.5s
Power Frequency Withstand Voltage	AC 4 kV / 1min
Lightning Impulse Withstand Voltage	6 kV 1.2 / 50 μs
Max Reading	9999999.9 kWh / kVARh
Internal Power Consumption	≤ 2W
Operating Temperature	-25°C ~ +55°C
Relative Humidity	20% ~ 90%
Protection Rating	IP51 (indoor)
Altitude	≤ 2000 m

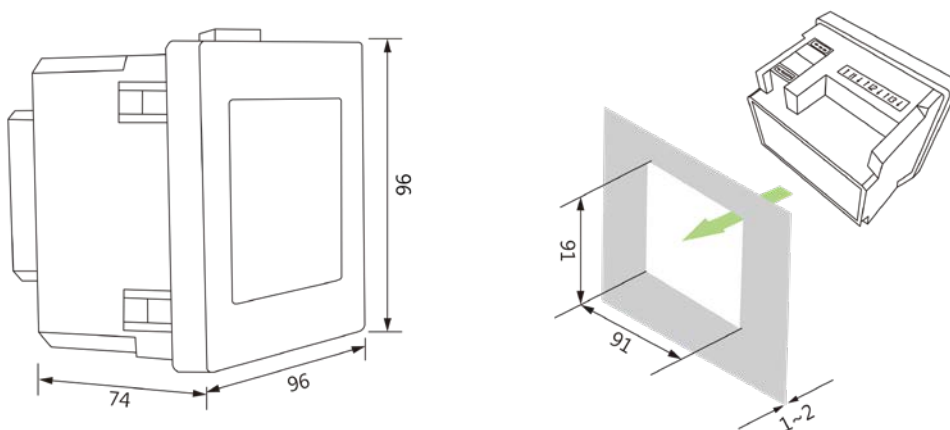
## Measurements

Voltage L-N	V1, V2, V3, V <sub>Avg.</sub>
Voltage L-L	V1-2, V2-3, V3-1, V <sub>Avg.</sub>
Current	I1, I2, I3, I <sub>Avg.</sub> , I <sub>N</sub>
Active Power	P1, P2, P3, P <sub>total</sub> (total active power)
Reactive Power	Q1, Q2, Q3, Q <sub>total</sub> (total reactive power)
Apparent Power	S1, S2, S3, S <sub>total</sub> (total apparent power)
Power Factor	PF1, PF2, PF3, PF <sub>total</sub> (total power factor)
Frequency	Hz
Active Energy	Ep_imp (import active energy), Ep_exp (export active energy), Ep_total (total active energy)
Reactive Energy	Eq_imp (import reactive energy), Eq_exp (export reactive energy), Eq_total (total reactive energy)
Total Harmonic Distortion	THD
Individual Harmonic Distortion	IHD
Maximum Demand	MD

## Accuracy

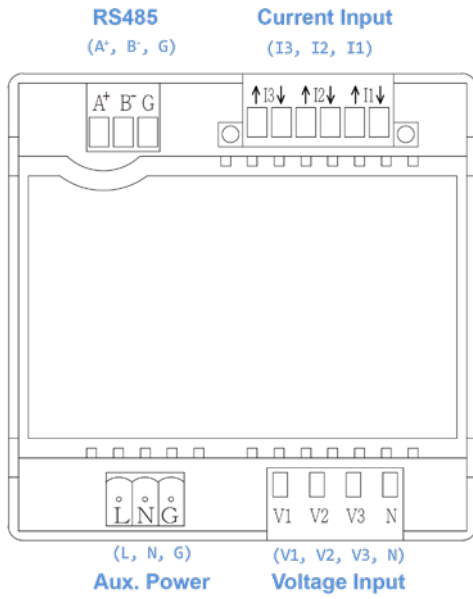
Voltage (V)	± 0.2%
Current (A)	± 0.2%
Frequency (Hz)	± 0.2%
Power Factor (PF)	± 1%
Active Power (W)	± 0.5%
Reactive Power (VAR)	± 1%
Apparent Power (VA)	± 1%
Active Energy (kWh)	Class 0.5S (IEC 62053-22)
Reactive Energy (kVARh)	Class 2
THD & IHD	± 2%

## Installation Dimensions (Cutout: 91 × 91 cm)

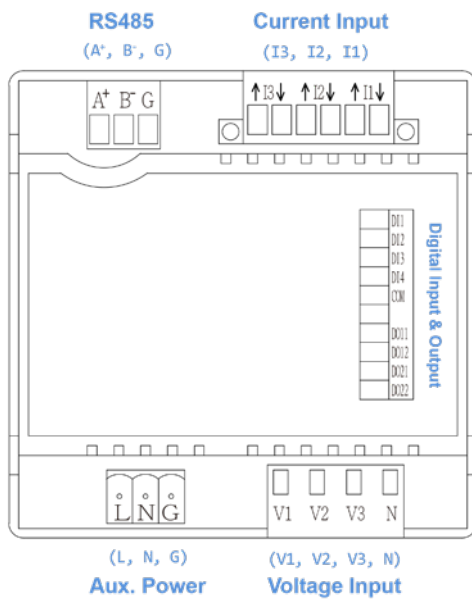


(Unit: mm)

## Rear View and Terminals

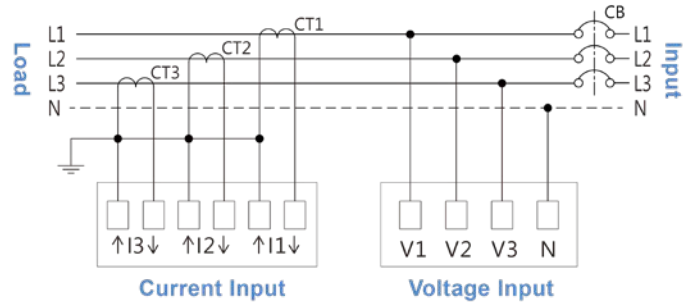


CMFM-F

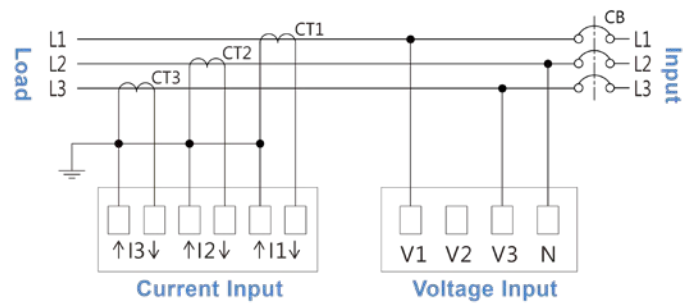


CMFM-G

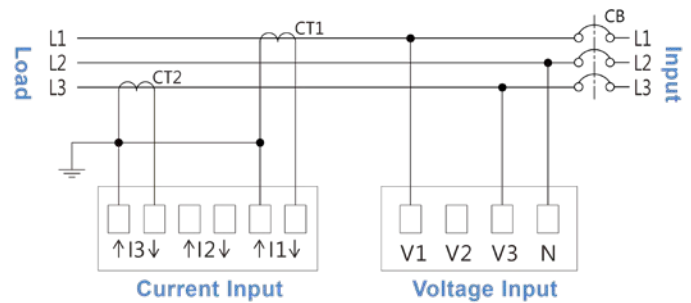
## Wiring Diagrams



3P4W - 3 CT



3P3W - 3 CT



3P3W - 2 CT



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