



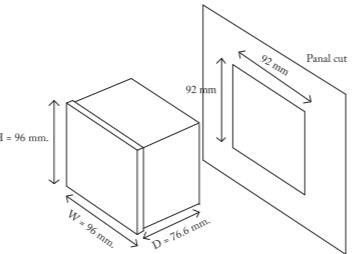
KM-07



## ■ TECHNICAL SPECIFICATION

Power Supply		230 VAC ±15 % 50-60 Hz
Power Consumption		2.5VA
Display		LCD
Input	Type	Voltage (TRUE RMS)
	Direct Phase and Neutral	10 to 290 VAC
	Direct Between Phase	10 to 500 VAC
	Primary Voltage	Up to 72000 VAC
	Secondary Voltage	60, 100, 110, 173, 190, 240 VAC
	PT Ratio	1-300
	Accuracy	± 0.2 % FS.
	Type	Current (TRUE RMS)
	Direct	20 mA to 10 A
	Primary Current	Up to 10000 A
	Secondary Current	20 mA to 5 A
	Accuracy	±0.2% FS.
	Type	Power
	Accuracy	± 0.5 % (FS)
Digital Output	Type	Power Factor
	Accuracy	± 0.2 % (FS)
	Type	Frequency
	Accuracy	45 to 65 Hz ± 0.1Hz
	Active Energy Accuracy	IEC 61036 Class 0.5
	Reactive Energy Accuracy	IEC 61036 Class 1.0
	THD	Volt, Current
	Speed	32 Pulse/sec
	Voltate Operate	10-48 VDC
Communication	Protocol	MODBUS RTU
	Baud Rate	2400, 4800, 9600, 19200 38400 bps
	Parity	None, Even, Odd
	Stop Bits	1, 2
	Data Bits	8 Bits
Ambient Operation	Support Device Node	128
	Temperature	-10 °C to 60 °C
	Humidity	85 % RH Non-Condensing
	Ambient Storage	-20 °C to 80 °C
Ambient Storage	Humidity	85 % RH Non-Condensing
	Front Protection Rating	IP52
Protection Degree	Case Protection Rating	IP30
	Installation	Panel Mounting
Material	Material	ABS-V0
	Size	96 x 96 x 76.6 mm.
Weighth	Weighth	465 g.

## ■ DIMENSION



## ■ DESCRIPTION

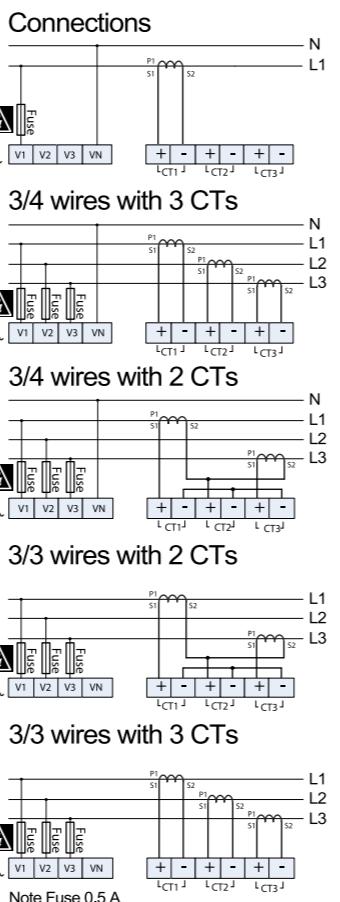
- KM-07 is a power meter. Can measure V(Line), V (Phase), A (Phase) kW, kVA, kVar, kWh, kVAh, kVarh, PF, Hz, kW Demand, Peak Demand, THD (Harmonic) for 1 Phase / 3 Phase
- LCD display
- Potential Transformer Ratio (PT) and Current Transformer Ratio (CT) can be set.
- Pulse output, Analog 4-20 mA
- Can communicate via RS-485 port, MODBUS RTU PROTOCOL

## ■ OPERATION

KM - 07 is a meter that can measure Volt, Amp, Watt, var, VA, kWh, kvarh and kVAh. It can measure the phase angle between current and voltage and THD% of Volt and Amp. RS - 485 communication with MODBUS RTU PROTOCOL. Measures kWh, kvarh and kVAh 13 digits (9,999,999,999,999)

## ■ WIRING DIAGRAM

The circuit of KM - 07 can be connected according to the diagram below. When the current transformer ( CT ) is removed from the KM - 07. Short circuit on secondary side of CT All to protect against CT damage



## Display and Key Pad Function

Measurable value display Can be selected according to Function Key Pad. Table 1 is a summary of the parameters that can be displayed by the button.

Table 1 Summary of selectable impressions in each button

V/I	P-1Ø	P-3Ø	En
Volt Phase-neutral	Phase kWatt	Energy 14 digit	Rolling Energy information display
Current	Phase kVar	Demand	Imp , Exp, total kWh
Volt Phase-Phase	Phase kVA	Max Demand	KvarhA <sup>~3</sup> kVAh
KVA	Total kVA	Min Demand	(Imp , Exp kWh
THD-I	Total kWatt	Date/Time	
THD-V	Total kVar	Hours Counter	

## Phase (key V/I)

1 2400 V  
500 A  
1.199 KVA  
PF 0.999  
imp 0.000 kWh

Volt Phase - Neutral Display  
Amp Phase, kVA and PF of Phase By pressing the V/I button, the front number changes accordingly.  
Phase displayed if Loop Page is set.  
The display will only loop at this Page.

## Volt Between Line - Line (key V/I)

1-2 4156 V  
2-3 4156  
3-1 4156  
500  
imp 0.000 kWh

Displays Volt line to line and system frequencies.  
The numbers are 1-2, 2-3 and 3-1 in front.

## % THD-V/ THD-I (key V/I)

1 39  
2 39  
3 39  
U THD Avg 39 %  
imp 0.000 kWh

When the THD-V is displayed, the U and THD icons appear.  
When the THD - I value is displayed, icons I and THD appear.

## Power (key P-1Ø)

1 1.199 kW  
0.000 Kvar  
1.199 KVA  
PF 0.999  
imp 0.000 kWh

Show the kWatt, kvar, kVA and PF values of each phase.  
By pressing P - 1Ø, the front number changes according to the displayed phase.

## Total Power (key P-1Ø)

3599 kW  
0.000 Kvar  
3599 KVA  
PF 0.999  
imp 0.000 kWh

Show total kWatt, kvar, kVA, and PF total of systems.  
(To display total value, there will be no figure showing the front phase.)

## Phase Angle Between V&I (key P-1Ø)

3599  
3599  
3599  
500  
UI imp 0.000 kWh

Displays the Phase Angle between Volt & Current and the Freq value of the system

## Energy (key P-3Ø & key En)

-En-

9999  
imp 9999999999 kWh

Display the Energy Value in the 10th to 13th of the Energy Value. And Energy Core 1 - 9 of Energy  
By pressing the key, En shows the Energy Imp, Exp, total of kWh, kvarh, and kVAh.

## Total Demand (key P-3Ø)

3599 kW  
0.000 Kvar  
3599 KVA  
Deman PF imp 0.000 kWh

Display Demand Total kWatt, kvar, kVA, and PF total.  
(In the Total display, no numbers are shown on the front.)

## Date (key P-3Ø)

date  
30 04 13

Display the date / month / year on the Meter

## Time (key P-3Ø)

time  
9 21 12

Display hours: minutes: seconds on Meter

## Hours Counter (key P-3Ø)

hour  
cnt  
1

Display Meter working Hours. Unit is hour (Count only when measured at kVA > 0)

## Reset Energy

- Set Parameter RES in Parameter Menu to 1.
- Go to Page En and press P-3Ø & En at the same time for 5 seconds when the Energy value To 0, the Parameter RES becomes 0

## Reset MD

- Set Parameter RES in Parameter Menu to 1.
- Go to Page Total Demand and press P - 3Ø & En simultaneously for 5 seconds. When the Demand value is 0, the Parameter RES becomes 0

## Reset Hour Counter

- Set Parameter RES in Parameter Menu to 1.
- Go to Page Hours and press P - 3Ø & En simultaneously for 5 seconds. When Page Hours is 0, the Parameter RES becomes 0

## ■ ORDERING CODE

KM-07- □ - □

Metering
A Total kWh
B Total, Import, Export kWh

Output
None Pulse Output
1 Analog Out, Pulse Output
2 RS-485, Pulse Output
3 RS-485, Analog Out,Pulse Output

## Setting Parameter

Accessing Menu Settings

1. Press V / I with P - 1Ø simultaneously to enter Menu.

2. Set Password to enter Setting Parameter.

PWS-

- above the PWS value, 0000 is a Cursor.  
 V / I button for fuzzy Cursor  
 P - 1Ø button increases the PWS value at the cursor position.  
 P - 3Ø button reduces the PWS value at the cursor position.  
 The En button returns to the Meter display page.  
 Press V / I and P - 1Ø simultaneously to stand still. PWS

## Table parameter 1.

List	Description	Value
rES	Enable Reset Energy Value	0 = Disable, 1 = Enable
cfr	CT Ratio	1 to 2000
Ptr	PT Ratio	1 to 300
rdPr	Demand Calculate period	1 to 60
Auto	Display page V/I loop	0 = Disable 1 to 60 Period Display

Parameter in Table 1 uses Key Command to modify the value.

V / I button to the next variable.

P-1Ø button for fuzzy Cursor

P-3Ø button increments the cursor position.

The En button returns to the previous variable

## Table parameter 2.

List	Description	Note
PWS	PWS	
rEc	RTC	
coRt		A2, A3, B2, B3
RnAl	Analog transfer	A1,A3,B1,B3
PUL5	Puls Output	A1,A3,B1,B3

Parameter in Table 2 uses Key Command to edit the value. Press

V / I and P-1Ø buttons simultaneously for entry / exit.

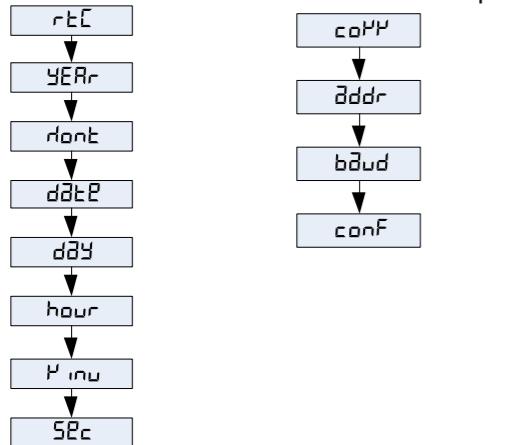
V / I button to the next variable.

P-1Ø button for sliding Cursor (for setting RTC and Port will increase value )

The P - 3Ø button increments the cursor position ( for RTC and Port settings, it decreases ).

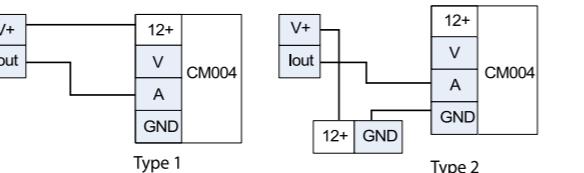
The En button returns to the previous variable.

## Setting RTC



## Communication port

## Analog circuit diagram



## Analog Transfer Calculation

The mA value to be calculated from

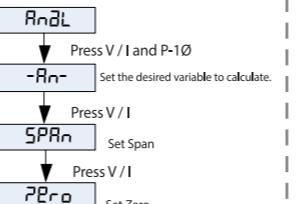
$$Iout = \frac{\text{Measurementvalue} - \text{Zero}}{\text{Span} - \text{Zero}} \times 16 + 4 \text{ mA}$$

In the case of setting CT and PT ratio,

CT and PT divide the current measured value.

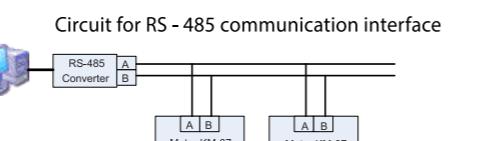
It is calculated

## Set Analog Transfer



## Communication with MODBUS RTU

Meter KM - 07 can read parameter values measured in real time With the RS - 485 BUS system, PROTOCOL is used for communication. MODBUS RTU



## Table parameter 3.

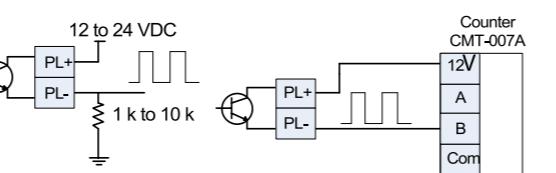
List	Description	Value
addr	Address Meter	1 to 245
baud	Baud Rate	2,4, 9,6, 19,2
coHF	Parity, Stop Bit	n 1S : None Parity 1, Stop Bit E 1S : Even Parity 1, Stop Bit o 1S : Odd Parity 1, Stop Bit n 2S : None Parity 2, Stop Bit E 2S : Even Parity 2, Stop Bit o 2S : Odd Parity 2, Stop Bit

## Table parameter 4 Pulse Output

List	Description	Value
PL - i	Pulse 1, Pulse / kwh	0.001 to 1 kwh
PL - z	Pulse 2, Pulse / kvarh	0.001 to 1 kvarh

The pulse output circuit is an opto transistor, so it has a maximum voltage of 24 VDC.

The circuit to use the pulse can be connected as shown.



## Table parameter 4 Analog Transfer Output

List	Description	Span	Zero
Pero	Away Drive 4 mA		
FULL	Away Drive 20 mA		
U 1	Use Volt Phase 1 for calculate Output	250.0 V	50.0 V
V 2	Use Volt Phase 2 for calculate Output	250.0 V	50.0 V
V 3	Use Volt Phase 3 for calculate Output	250.0 V	50.0 V
i 1	Use Current Phase 1 for calculate Output	5.00 A	0 A
i 2	Use Current Phase 2 for calculate Output	5.00 A	0 A
i 3	Use Current Phase 3 for calculate Output	5.00 A	0 A
R 1	Use kW Phase 1 for calculate Output	1.250 kW	0 kW
R 2	Use W Phase 2 for calculate Output	1.250 kW	0 kW
R 3	Use Use kW Phase 3 for calculate Output	1.250 kW	0 kW
Ukr 1	Use kvar Phase 1 for calculate Output	1.250 kvar	0 kvar
Ukr 2	Use kvar Phase 2 for calculate Output	1.250 kvar	0 kvar
Ukr 3	Use kvar Phase 3 for calculate Output	1.250 kvar	0 kvar
Rkr 1	Use kVA Phase 1 for calculate Output	1.250 kVA	0 kVA
Rkr 2	Use Use kVA Phase 2 for calculate Output	1.250 kVA	0 kVA
Rkr 3	Use kVA Phase 3 for calculate Output	1.250 kVA	0 kVA
PF 1	Use PF Phase 1 for calculate Output	1.000 1.000	0
PF 2	Use PF Phase 2 for calculate Output	1.000	0
PF 3	Use PF Phase 3 for calculate Output	1.000	0
Rt	Use otal kW for calculate Output	3.750 kW	0 kW
RtR	Use Total kvar for calculate Output	3.750 kvar	0 kvar
RtR	Use Total kVA for calculate Output	3.750 kVA	0 kVA
PF	Use TotalPF for calculate Output	1.000	0

Parameter in Table 2 uses Key Command to edit the value. Press

V / I and P-1Ø buttons simultaneously for entry / exit.

V / I button to the next variable.

P-1Ø button for sliding Cursor ( for setting RTC and Port will increase value )

The P - 3Ø button increments the cursor position ( for RTC and Port settings, it decreases ).

The En button returns to the previous variable.

## Table 1 Phase PF, Hz and Signed

Offset	Address	Hex	Contents	Format	Bytes	Words	Access
0	0	00	Phase 1 PF	Signed int	2	1	Read Only
1	1	01	Phase 2 PF	Signed int	2	1	Read Only
2	2	02	Phase 3 PF	Signed int	2	1	Read Only
3	3	03	PF 3-PH	Signed int	2	1	Read Only
4	4	04		Signed int	2	1	Read Only
5	5	05	Signed of Phase 1 Watt	Signed int	2	1	Read Only
6	6	06	Signed of Phase 2 Watt	Signed int	2	1	Read Only
7	7	07	Signed of Phase 3 Watt	Signed int	2	1	Read Only
8	8	08	Signed of Phase 1 var	Signed int	2	1	Read Only
9	9	09	Signed of Phase 2 var	Signed int	2	1	Read Only
10	10	0A	Signed of Phase 3 var	Signed int	2	1	Read Only
11	11	0B	Revert Total Watt	Signed int	2	1	Read Only
12	12	0C	Signed of Total var	Signed int	2	1	Read Only

$$\text{Calculating PF } PF = \frac{PFreg}{1000}$$

$$\text{Calculating Hz } Hz = \frac{Hzreg}{10}$$

If Register Signed is 1 . Show that the power of the variable is negative.

## Table 1 Phase PF, Hz and Signed

Offset	Address	Hex	Contents	Format	Bytes	Words	Access
0	256	100	Phase 1 Volts	Unsigned long	4	2	Read Only
1	257	101	Phase 2 Volts	Unsigned long	4	2	Read Only
2	258	102	Phase 3 Volts	Unsigned long	4	2	Read Only
3	259	103	Ph1-Ph2 Volts	Unsigned long	4	2	Read Only
4	260	104	Ph2-Ph3 Volts	Unsigned long	4	2	Read Only
5	261	105	Ph3-Ph1 Volts	Unsigned long	4	2	Read Only
6	262	106	Phase 1 Current	Unsigned long	4	2	Read Only
7	263	107	Phase 2 Current	Unsigned long	4	2	Read Only
8	264	108	Phase 3 Current	Unsigned long	4	2	Read Only
9	265	109	Phase 1 kW	Signed long	4	2	Read Only
10	266	10A	Phase 2 kW	Signed long	4	2	Read Only
11	267	10B	Phase 3 kW	Signed long	4	2	Read Only
12	268	10C	Phase 1 kvar	Signed long	4	2	Read Only
13	269	10D	Phase 2 kvar	Signed long	4	2	