



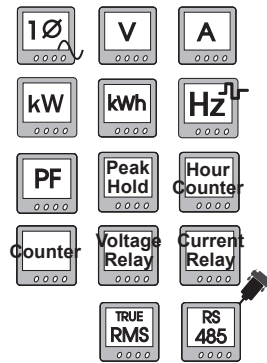
KM-22-1-P7



KM-22-1-P9



KM-22-1-DI



Specification

		KM-22-1-P7	KM-22-1-P9	KM-22-1-DI
Power Supply		110-240VAC 50-60Hz		
Power Consumption		3-5VA		
Display		7-Segment, Size 0.39 Inch, 4 Digit 2 Row, 7 Digit, 1 Row	7-Segment, Size 0.56 Inch, 4 Digit 2 Row 7-Segment, Size 0.39 Inch, 8 Digit 1 Row	7-Segment, Size 0.39 Inch, 4 Digit 2 Row, 8 Digit, 1 Row
Input	Voltage	1 Phase		
	Voltage Range	10-400VAC		
	Accuracy Voltage	±0.5% FS.		
	Current	Connection 1 CT, Direct		
	Current Transformer Ratio	1-2000		
	Primary	9999 AMP		
	Secondary	0.01-5A		
	Accuracy Current	±0.5% FS.		
	kWh	Class 1		
	Counter Input	Dry Contact Max 1k Hz		
Reset Input	Dry Contact			
Output		SPST 3A 250VAC/3A 30VDC	SPDT 5A 250VAC/5A 30VDC	SPDT 5A 250VAC/5A 30VDC
Communication	Protocol	Modbus RTU		
	Baud Rate	2400, 4800, 9600,19200, 38400,57600, 115200 bps		
	Parity	None, Even, Odd		
	Stop Bits	1, 2		
	Data Bits	8 Bits		
	Support Device Node	255		
Ambient Operation	Temperature	-10 °C to 60 °C		
	Humidity	85 % RH Non-Condensing		
Ambient Storage	Temperature	-20 °C to 80 °C		
	Humidity	85 % RH Non-Condensing		
Protection Degree		Panel Encloser		DIN RAIL Encloser
		Front Protection Rating : IP52		Case Protection Rating : IP30
		Case Protection Rating : IP30		
Installation		Panel Mounting		DIN RAIL
Material		ABS-V0		
Size (mm.)		72 x 72 x 73	96 x 96 x 76.6	90 x 105 x 61.5
Weight (kg.)		300	320.	280

Description

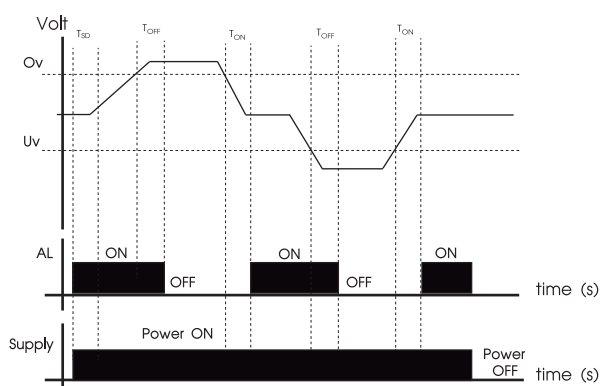
- Single Phase Volt-Amp-kW-kWh-Hz-PF Meter with Protection Relay : KM-22-1 is a meter for measuring voltage (V), current (A), and electrical energy (kWh), complete with a protection relay for single-phase power systems.
- Under and Over Voltage Relay.
- Under and Over Current Protection Relay.
- Voltage measurement range 10–400 VAC.
- Current measurement range 0.01–5 A, maximum display current up to 9999 A via C.T. ratio range 1–2000 (10000/5A).
- Measured values: kW, kWh, P.F. (COS), Hz, Hour Counter, Counter display with relay output.
- Peak Hold for maximum values of voltage (V), current (A), and power (kW).
- True RMS measurement with high accuracy.
- RS-485 Modbus RTU Protocol.
- Able to display the total P.F. (Power Factor) of the entire system.
- Fault display with memory.
- LED indicators for measured values, output, and peak.

Operation

KM-22-1 is a meter for measuring Volt, Amp, kW, kWh, Hz, and PF, equipped with a Voltage Protection Relay for under-voltage and over-voltage protection, and a Current Relay for single-phase power systems. It also displays kW, kWh, P.F. (COS), Hz, Hour, and Counter values. In addition, it can store the maximum peak values of voltage (V), current (A), and power (kW) that occur, for analyzing the behavior of the electrical system.

The Voltage Protection Relay allows setting under-voltage and over-voltage thresholds in the range of 50–400 VAC, with an adjustable start-up delay time of 1–3600 seconds (ON Delay Time). Once activated, it monitors the voltage condition; if the voltage is lower or higher than the set value, the relay will switch OFF within 0–3600 seconds, which can be adjusted for faster or slower tripping as required, and the cause will be displayed on the display. When the voltage level returns to within the preset range, the relay will switch ON again within the preset time (ON Delay Time). After the KM-22-1 trips or the relay turns OFF, the cause of the relay OFF can be reviewed from the display.

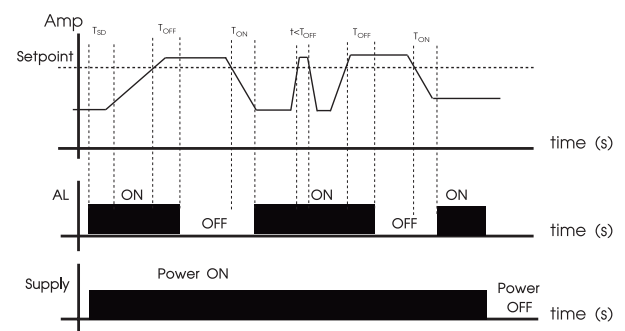
กราฟแสดงการทำงานของ Volt Protection แสดงดังกราฟที่ 1



Operation[Continue]

The Current Protection Relay allows setting under-current or over-current thresholds in the range of 0.1–9999 A, with an adjustable start-up delay time of 1–3600 seconds (ON Delay Time). Once activated, it monitors the current condition; if the current exceeds the set value, the relay will switch OFF within 0–3600 seconds, which can be adjusted for faster or slower tripping as required, and the cause will be shown on the display. When the current level returns to below the preset value, the relay will switch ON again within 1–3600 seconds, or it can operate in the opposite manner (Inverse Function), where the relay will turn ON when the current is higher than the set value. After the KM-22-1 trips or the relay turns OFF, the cause can be reviewed from the display.

กราฟแสดงการทำงานของ Current Protection Relay แสดงดังกราฟที่ 2



Relay Output for kW, Hour, and Counter

The alarm relay for kW, Hour, and Counter can be selected to perform load switching control, operating with only one of the following functions . at a time.

kW Function allows setting the kW value from 0–100% of the measurement range and setting the start-up delay time from 1–3600 seconds (ON Delay Time). Once activated, it monitors the kW consumption; if the kW value exceeds the preset level, the relay will switch OFF within 0–3600 seconds, which can be adjusted for faster or slower tripping as required, and the cause will be displayed. When the kW level returns below the preset value, the relay will switch ON again within 1–3600 seconds, or it can operate in the opposite manner (Inverse Function), where the relay will turn ON when the kW value is higher than the set value.

Hour Counter Function measures the operating hours of machinery and allows setting the required operating time. When the preset time is reached, the relay will switch ON, and it can be reset to OFF either by pressing a button or by using the terminal reset.

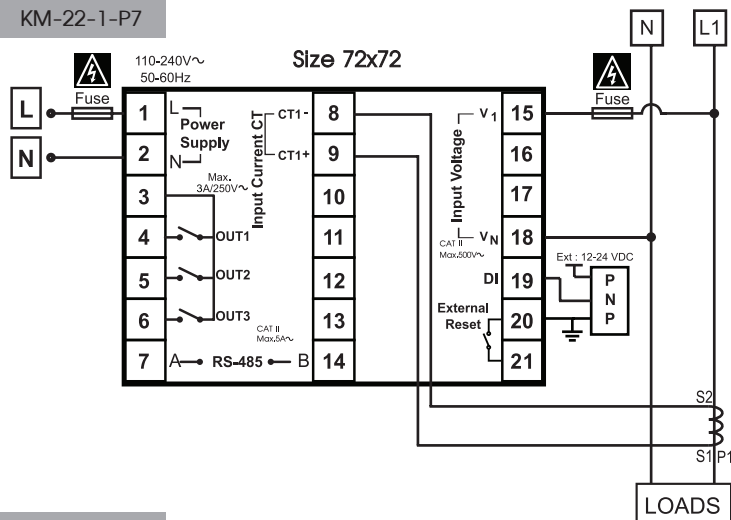
Counter Function measures the number of produced items and compares it with energy consumption (kWh) to evaluate electrical cost per unit produced (Cost per Unit). The desired quantity can be set; when the preset count is reached, the relay will switch ON, and it can be reset to OFF by pressing a button or via the terminal reset.

Manual and Auto Display

The display of measured values Volt, Amp, kW, kWh, P.F., Hz, Hour, and Counter can be operated in Manual mode, where values are selected by pressing the keypad on the device, or in Auto mode, where the values Volt, Amp, kW, kWh, P.F., Hz, Hour, and Counter are displayed sequentially and continuously. The display time can be set from 10 to 60 seconds per phase. If auto display is not required, it can be disabled by setting the display time to 0.

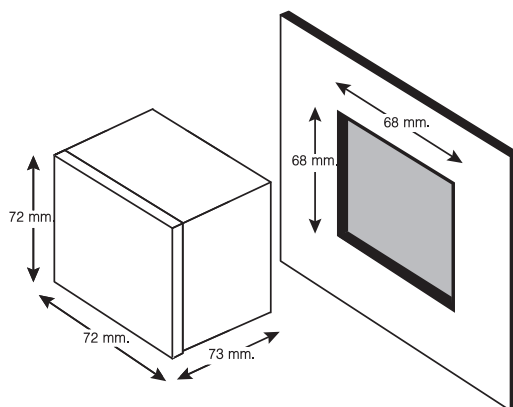
Wiring Diagram

KM-22-1-P7

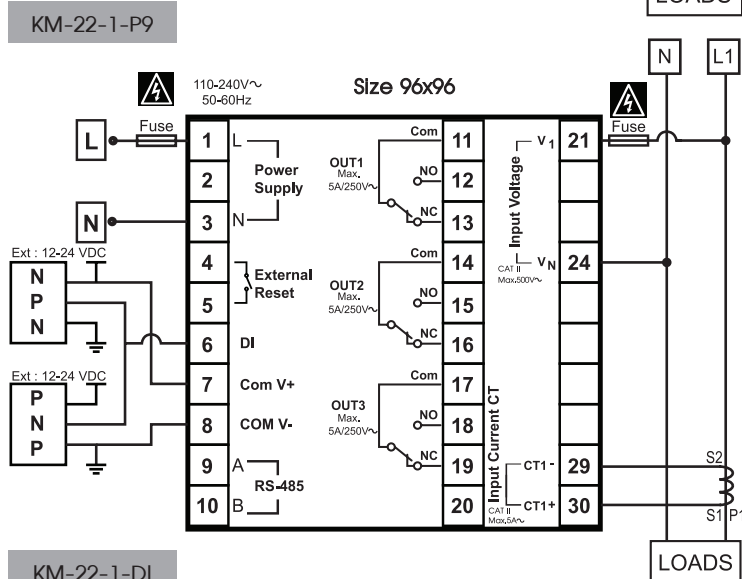


Dimension

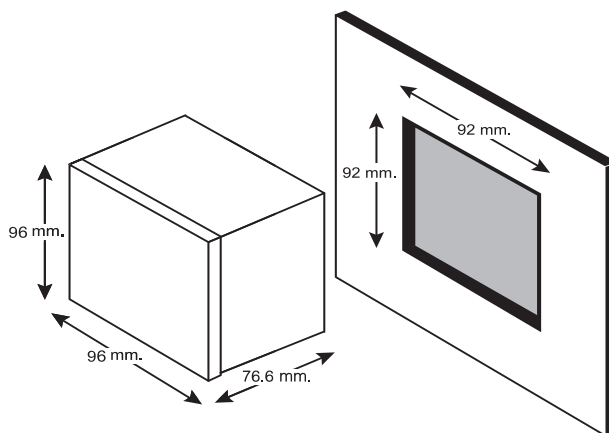
KM-22-1-P7



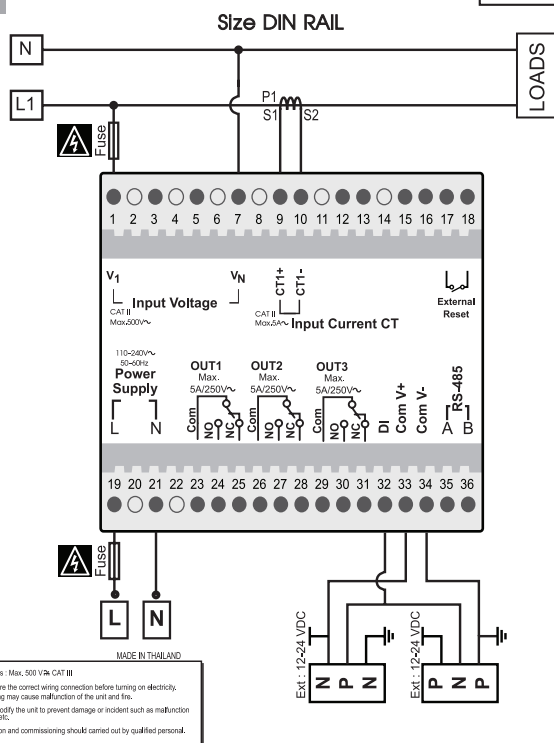
KM-22-1-P9



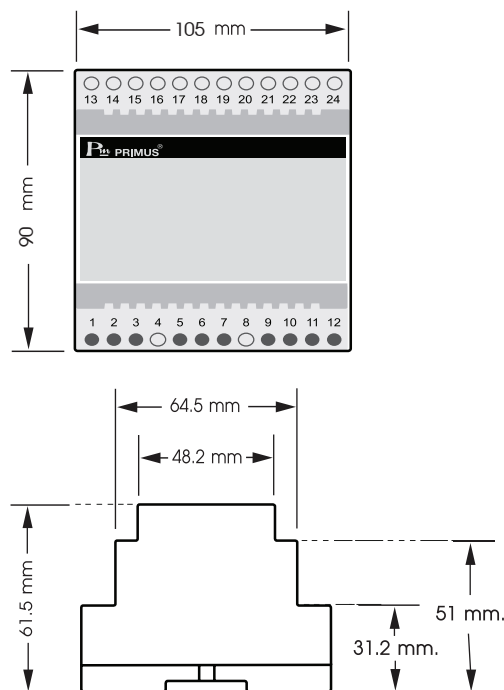
KM-22-1-P9



KM-22-1-DI

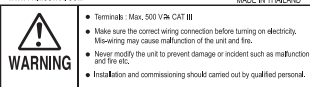


KM-22-1-DI



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MADE IN THAILAND



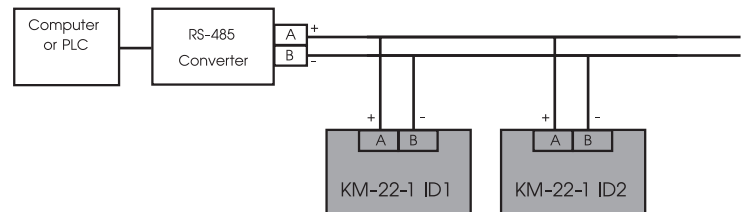
SERIAL COMMUNICATIONS

KM-22-1-DI can read various measured parameter values in real time via the RS-485 bus system, using the communication protocol MODBUS-RTU Mode

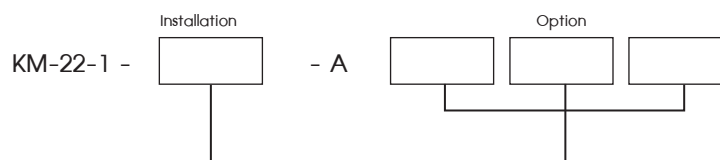
The available command set is:

- 0x03 : Read Holding Register
- 0x04 : Preset Input Register
- 0x06 : Preset Single Register
- 0x10 : Preset Multi Register

Wiring Diagram



Ordering Code



Installation	
DI	DIN RAIL
P7	Panel 72 x 72
P9	Panel 96 x 96

Option 1	
NONE	Alarm Voltage and Current Protection Relay Function
B	Alarm Relay 2 : Voltage and Current Protection Relay Function
C	Alarm Relay 3 : kW, Hour Counter and Counter Function
M	RS-485

Example: KM-22-1-P9-ABM means Alarm Relay 1, Alarm Relay 2, and RS-485 Panel-mounted, size 96×96, and Power 230 VAC.