● THREE PHASE VOLT-AMP kW-kWh-PF METER WITH PROTECTION RELAY

KM-22

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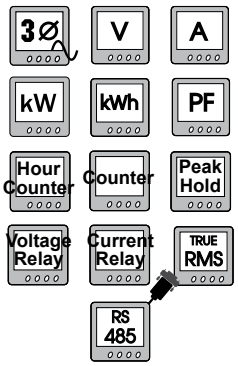
PRIMUS

KM-22-P7

KM-22-P9

KM-22-DI



TECHNICAL SPECIFICATION

		KM-22-P7	KM-22-P9	KM-22-DI
Power Supply		110-240 VAC 15 % 50-60 Hz		
Power Consumption		2.5VA		
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	3 Phase		
	Voltage Range	20-500 VAC		
	Accuracy Volt	±0.5% FS.		
	Current	Connection 3 CT, Direct		
	Current Transformer Ratio	1-2000		
	Primary	9999 AMP		
	Secondary	0.02-5A		
	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 bps		
	Parity	None, Even, Odd		
	Stop Bits	1, 2		
	Data Bits	8 Bits		
	Support Device Node	128		
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 Enclouser		DIN RAIL Enclouser
		Front Protection Rating : IP52		Case Protection Rating : IP30
		Case Protection Rating : IP30		
Installation		Panel Mounting		DIN RAIL
Material		ABS-V0		
Size (mm.)		72x72x73	96x96x76.6	90x105x61.5
Weight		275 g.	300 g.	200 g.

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DESCRIPTION

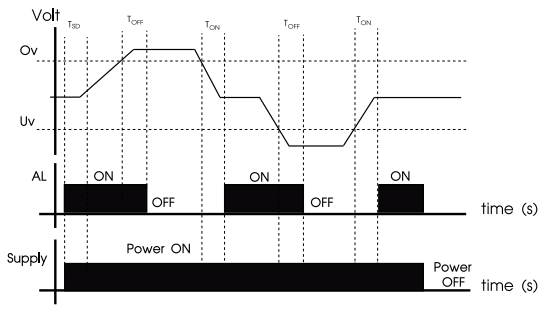
- Three phase voltage measurement system for up to maximum 500 VAC
- Current measurement range 0.01-5 A, showing maximum current value 9999 A by passing C.T. Ratio Range 1-2000 (10000 / SA)
- kW, kWh, hour counter, counter display with relay output
- Under and Over Voltage, Phase Sequence, Phase Lose, Asymmetry Protection Relay
- Under and Over Current Protection Relay
- Peak Hold for Maximum of voltage, current and kW
- Fault Display with Memory
- RS-485 Modbus RTU
- LED displays the measured values for each phase, Output and Peak
- Manual/ Auto Display Current and voltage values in each phase
- Total P.F. (Power Factor) display in the system

OPERATION

KM-22 is a measurement and display device for both voltage and current values in 3 phases. It also displays the values of kW, kWh, Hour and Counter. Hour values are the measurement of the working hours of the electrical system or machines to schedule maintenance. Counter is the number of products produced. To compare with the electrical energy (kWh) used to measure energy efficiency In addition, the peak value of voltage (V), current (A), and power (kW), can be remembered that can happen To analyze the feasibility of the electrical system

Voltage Protection Relay can set the voltage to fall or exceed between 50 to 500 VAC by setting the delay before starting from 1-3600 seconds (ON Delay Time), but if the phase sequence is incorrect, the Relay will not work and do not delay. When starting to work, it will capture the possibility of voltage if the voltage is lower or higher than the set value. Or the unbalance phase exceeds the set value or the missing phase. Relay will order OFF within 0-3600 seconds, which can be set to cut fast or slow as needed and display the reason Display. When the voltage level returns to the set voltage range, the Relay will return ON again within the set time (ON Delay Time).

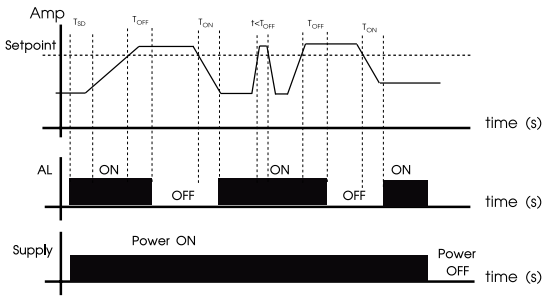
After the KM-22 circuit breaker or Relay OFF, can view the cause of the Relay OFF from the Display. The graph showing the operation of the Volt Protection is shown in graph 1.



Current Protection Relay can set low current or can be between 0.1 to 9999A. Set the delay time before starting to run from 1-3600 seconds (ON delay time). When starting, it will catch the possibility of electricity. If the electricity is higher than that set, the Relay will order OFF within 0-3600 seconds, which can be set to cut fast or slow as needed and display the cause at Display. When the current level returns to the level below the set, Relay will return. ON again within 1-3600 seconds

OPERATION

After the KM-22 circuit breaker or Relay OFF, can see the cause of the Relay OFF from the Display or reverse function. The current protection relay operation graph is shown in graph 2.



Relay Output for kW, Hour and Counter

Alarm Relay for kW, Hour, Counter. This can be selected to act on load contact Which one is

kW Function can set kW 0-100% of Range and set the delay time before starting from 1-3600 seconds (ON Delay Time) when starting and then capturing the possibility of kW being used if the kW value is higher The relay set will order OFF within 0-3600 seconds, which can be set to cut fast or slow as needed. And display the reason that the Display when the kW level returns to the lower level than the Relay will return ON again within 1-3600 seconds or to work in the reverse (Inverse Function) is Relay will ON when the kW value is higher set

Hour Counter Function can set the desired working hours at the end of the time. Relay sends ON and can be reset to OFF by pressing the button or using the Terminal Reset PIN.

Counter Function can set the desired amount when the number is set. Relay will order ON and can reset to OFF by pressing the button or using Terminal Reset PIN.

Manual and Auto Display

Display of Volt, Amp, kW, kWh, Hour and Counter values that can be measured in Manual mode, ie Volt, Amp, kW, kWh, Hour and Counter by pressing Key pad on the device or Auto is Displays Volt, Amp, kW, kWh, Hour and Counter values. Each phase rotates all the time. Which can be set to display values from 10 seconds to 60 seconds per phase If you do not want to display Auto, you can do so by setting the time to 0.

Calculating% Unbalance Voltage

Function of this function will check that the voltage of each phase is compared with the average voltage of all 3 phases with different values than the Unbalance set or not. If the value is higher will delay OFF Delay and Output Relay will stop working. Calculate% Unbalance (% UBL) according to equation 1 when the measured value is higher than Ub value The location will cause the Output Relay to stop (OFF) and the symbol display screen.

$$\%UBL = 100 \times \frac{V_{MD}}{V_{avg}} \quad (1) \qquad V_{avg} = \frac{(V_a + V_b + V_c)}{3} \quad (2)$$

V_{MD} is absolute maximum value of difference of each phase voltage and average voltage

$$V_{MD} = Max\left(|V_a - V_{avg}|, |V_b - V_{avg}|, |V_c - V_{avg}|\right) \quad (3)$$

Example if setting Ub = 20% and value $V_{avg} = 183$ V $V_a = 110$ $V_b = V_c = 220$

$|V_a - V_{avg}| = 73$V $|V_b - V_{avg}| = 37$V $|V_c - V_{avg}| = 39.8$V

$$\%UBL = 100 \times \frac{73}{183} = 37\%$$

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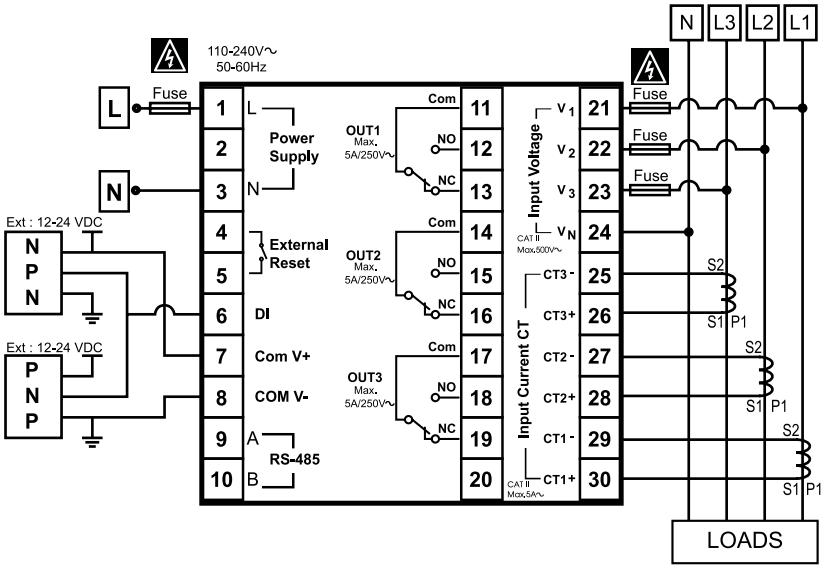
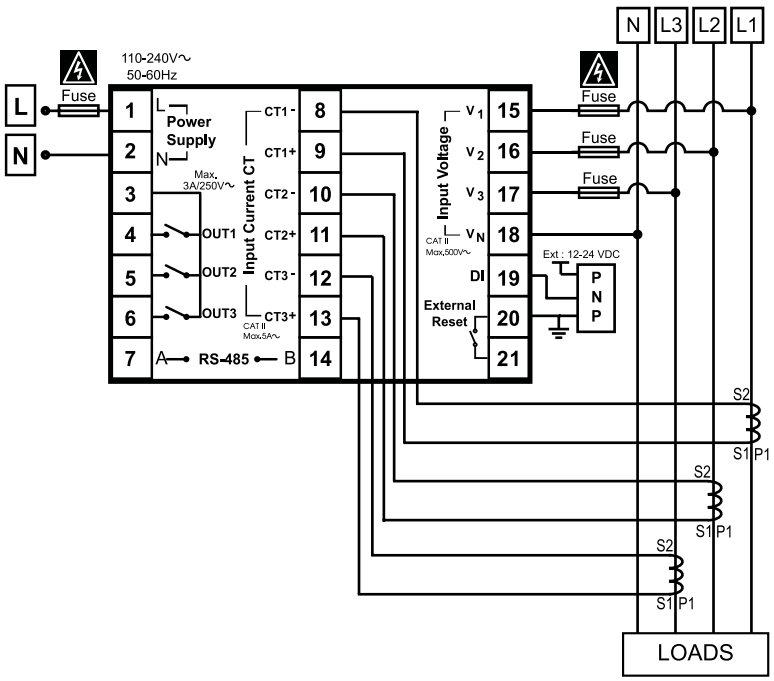
PRIMUS

WIRING DIAGRAM

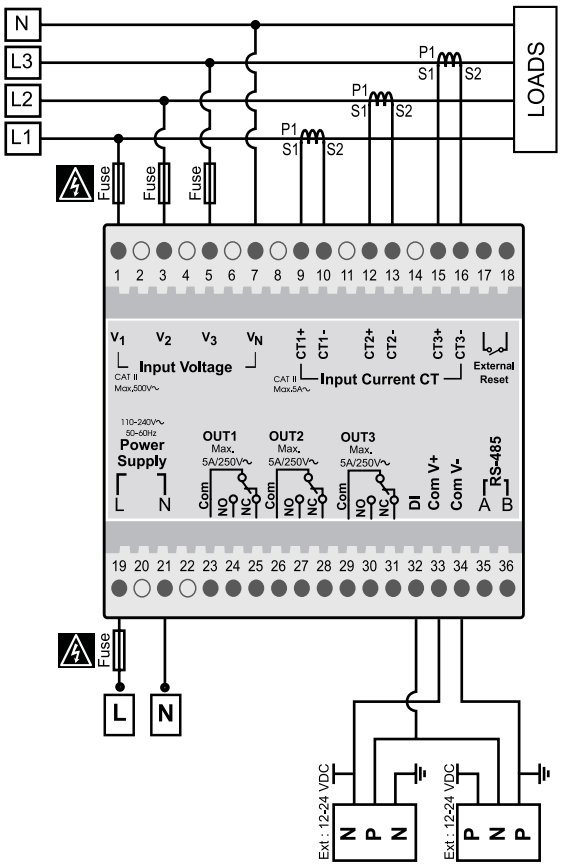
KM-22-P9
Size 96x96



KM-22-P7
Size 72x72



KM-22-DI
Size DIN RAIL



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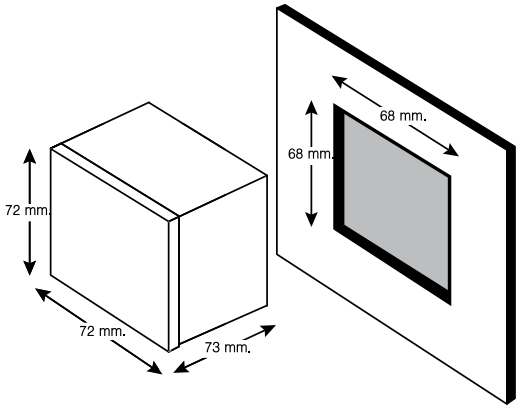
WARNING

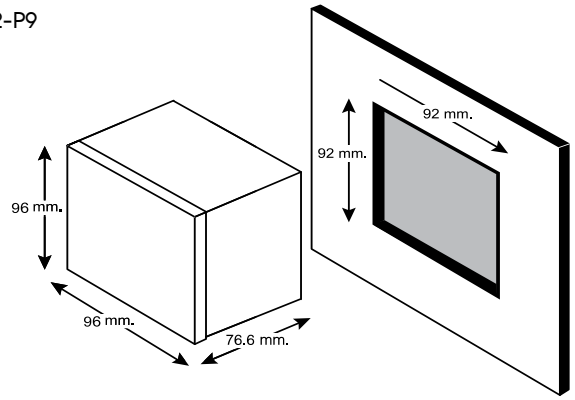
- Terminals : Max. 500 V≫ CAT III
- Make sure the correct wiring connection before turning on electricity. Mis-wiring may cause malfunction of the unit and fire.
- Never modify the unit to prevent damage or incident such as malfunction and fire etc.
- Installation and commissioning should carried out by qualified personal.

DIMENSION

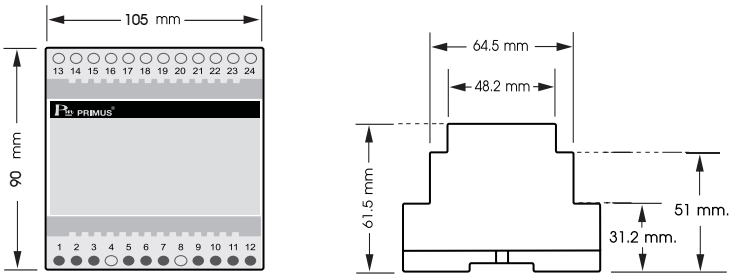
KM-22-P7



KM-22-P9



KM-22-DI



SERIAL COMMUNICATIONS

The KM-22 are Equipped With a RS-485 Series Communication Interfac etoAllow Connection to Computer or PLCs. MODBUS PROTOCOL is Provided as Standard Communication.

The User Can Connect KM-22 as Network Up to 128 Meters.

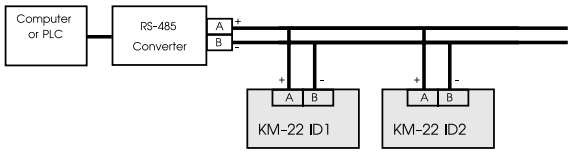
0x03 : Read Holding Register

0x04 : Preset Input Register

0x06 : Preset Single Register

0x10 : Preset Multi Register

Wiring Diagram



ORDERING CODE

KM-22 - [INSTALLATION] - A [OPTION] [OPTION] [OPTION]

INSTALLATION	
DI	DIN RAIL
P7	Panel 72x72
P9	Panel 96x96

OPTION 1	
NONE	Alarm Relay1 : 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-P9-ABM mean Alarm Relay1, Alarm Relay 2 and RS-485

Installation Panel size 96x96 and Power 230VAC