● VOLTAGE PROTECTION RELAY

VPM-05-D-SERIES

DIGITAL VOLTAGE PROTECTION RELAY

DESCRIPTION

- VPM-05 is relay to protect Over-Under voltage, Unbalance phase, Phase sequence.
- Electrical system 1-Phase and 3-Phase, 3 Wire/4 Wire.
- Measure accurate in True RMS.
- Show voltage result by 7-Segment LED 3 Digits size 0.39 inches
- Easy to wiring
- Output Relay size 5 A, 250 VAC, DPDT.
- DIN Rail installation.
- LED show status of output relay.

TECHNICAL SPECIFICATION

Model.		VPM-05-P2-2-D	VPM-05-P4-4-D	VPM-05-P4-3-D	VPM-05-P3-3-D	VPM-05-P3-4-D
Power Supply		220VAC ±20% 50-60Hz (1P/2W)	380VAC ±20% 50-60Hz (3P/4W)	380VAC ±20% 50-60Hz (3P/3W)		380VAC ±20% 50-60Hz (3P/4W)
Power Consumption		3 VA				
Display		7-Segment, Size 0.39 Inch, 3 Digit, 1 Row				
Input	Voltage Range	160-300 VAC	280 - 520 VAC(3Ø)			
	Over Voltage	230-290 VAC	400 - 500 VAC(3Ø)			
	Under Voltage	170-230 VAC	300 - 400 VAC(3Ø)			
	Phase Sequence	No			Yes	
	% Unbalance	2 - 20%				
	Hysteresis	1%				
	Accuracy	±0.5%rdg +1dgt				
	Resolution	1V				
Output	Relay Output	Relay DPDT Output 5A 250VAC				
	Time Delay Off	0 - 10 Sec				
	Time Delay On	0 - 900 Sec				
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		IP20				
Installation		DIN RAIL Mounting				
Material		ABS-V0				
Size (mm.)		55 x 72 x 100				
Weight		270g.				

OPERATION

VPM-05 is Digital Voltage Protection Relay that display result and measured value digital which made the display has accurate and cleary. When supply power VPM-05 will measure voltage that is normal or not means voltage do not over or lower from setting If everything is fine VPM-05 will start delay follow T-ON from setting (Range 0-900 Sec) when time has completed Output Relay will operate.

After that if VPM-05 check irregular comdition of high voltage lower than value from setting VPM-05 will start delay follow T-OFF (Range 0-10 Sec) when complete time Relay will stop operation.

% Unbalance calculation

Unbalance Voltage Detection

Unbalance voltage will check voltage of each phase compare with average voltage all 3 phase. There are difference % Unbalance that setting or not if the value higher than delay time it will stop operation then Relay will stop operate. % Unbalance calculation in 3 phase 4 wire will be follow as formula

$$\% UBL = 100 \times \frac{V_{MD}}{V_{avg}} \quad (1)$$

$$V_{avg} = \frac{V_a + V_b + V_c}{3} \quad (2)$$

V_{MD} is Absolute maximum of voltage difference in each phase with average voltage.

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

Example

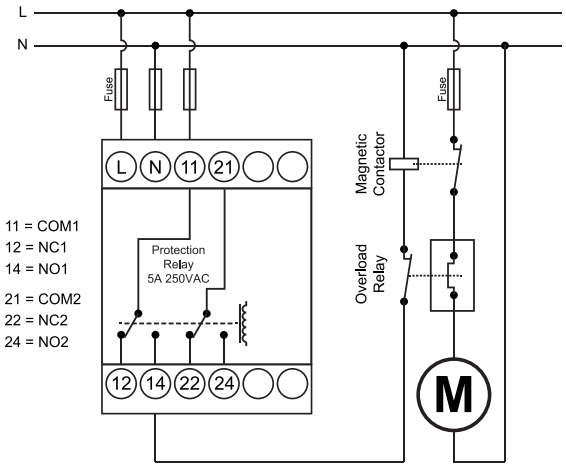
V_{avg} = 183 V, V_a = 110 V, V_b = 220 V, V_c = 220 V

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

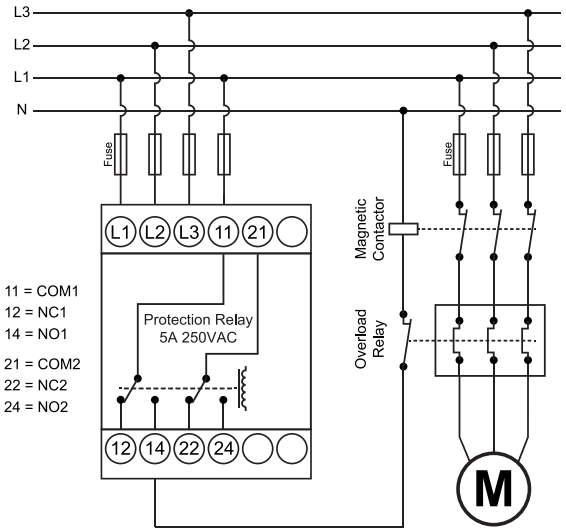
$$\% UBL = \frac{73}{183} \times 100 = 39.89\ \%$$

WIRING DIAGRAM

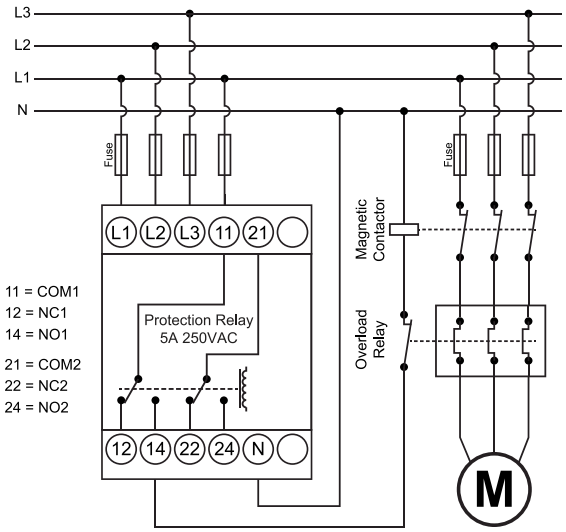
Input 1Phase / 2Wires (VPM-05-P2-2-D)



Input 3Phase / 3Wires (VPM-05-P3-3-D, VPM-05-P4-3-D)



Input 3Phase / 4Wires (VPM-05-P3-4-D, VPM-05-P4-4-D)



WARNING

More than one power source.
Relay outputs maybe at mains potential.
Disconnect power from all source before install or servicing.

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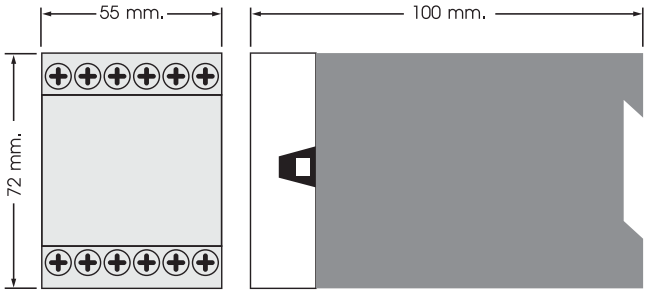
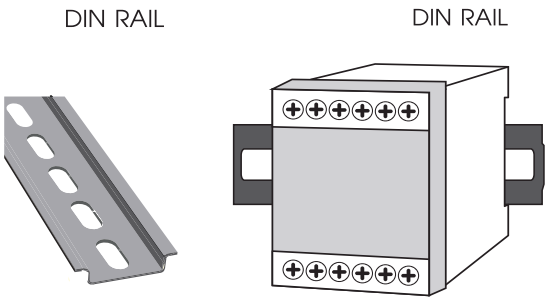
PRIMUS

DIMENSION



INSTALLATION



ORDERING CODE

VPM - 05 - [Input Signal] - [Electrical System] - D

Input Signal	
P2	1 Phase
P3	3 Phase + Phase Sequence
P4	3 Phase

Electrical System	
2	1Phase / 2Wires
3	3Phase / 3Wires
4	3Phase / 4Wires

EX. VPM-05-P3-3-D

- หมายถึง Electrical System : 3Phase / 3Wires
- หมายถึง Input Signal : 3Phase + Phase Sequence
- หมายถึง Output Type : Relay 1 Out (DPDT)