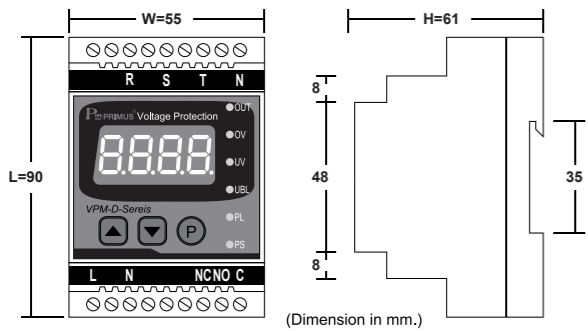




TECHNICAL SPECIFICATION

Model	VPM-01-D	VPM-01-024-D	VPM-01-220-D	VPM-01-380-D	VPM-01-D-50	VPM-01-024-D-5
Power Supply	220VAC ±15% 50/60Hz (Auxiliary Supply)	24 VAC/VDC ±15% (Auxiliary Supply)	No Auxiliary Supply	No Auxiliary Supply	220VAC ±15% 50/60Hz (Auxiliary Supply)	24 VAC/VDC ±15% (Auxiliary Supply)
Power Consumption	3 VA					
Display	7-Segment, Size0.39inch, 4 Digit, 1 Row					
Input	Voltage Range	20-500 VAC (30)	20-500 VAC (30)	187-253 VAC (30)	323-437 VAC (30)	5-50 VAC (30)
	Phase Sequence	Phase Sequence				
	%Unbalance	0.0 - 50.0%				
	Accuracy	0.25% Full Scale				0.5% Full Scale
Output	Relay Output	1 Relay Output 10A 250VAC				
	Delay Time	Start Delay Time (ST)	1 - 3600 Sec			
Ambient Operation	Temperature	-10°C to 60°C				
	Humidity	85 % RH Non-Condensing				
	Temperature	-20°C to 80°C				
	Humidity	85 % RH Non-Condensing				
Protection Degree	IP40					
Installation	DIN RAIL Mounting					
Material	ABS-V0					
Size (mm.)	61 x 90 x 55					
Weight	240g.					

DIMENSION



SPEC

Model	Over Under Protection	Phase Sequence Protection	Phase Loss Protection	Phase Unbalance Protection	220 VAC Auxiliary Supply	24 VDC Auxiliary Supply	No Voltage Auxiliary Supply	Voltage Range (20-500 VAC)	Voltage Range (187-253 VAC)	Voltage Range (323-437 VAC)	Voltage Range (5-50 VAC)
VPM-03-D	●	●	●	●	●	●	●	●	●	●	●
VPM-03-024-D	●	●	●	●	●	●	●	●	●	●	●
VPM-03-220-D	●	●	●	●	●	●	●	●	●	●	●
VPM-03-380-D	●	●	●	●	●	●	●	●	●	●	●
VPM-01-D-5	●	●	●	●	●	●	●	●	●	●	●
VPM-01-024-D-5	●	●	●	●	●	●	●	●	●	●	●

DESCRIPTION

- VPM-01-D is Voltage Protection for protect Under - Over voltage, Phase loss, Unbalance Phase, Phase Sequence.
- Display by 7-Segment 4 Digits Size 0.39 inches
- Output Relay 1 Output 10A 250VAC.
- There are Memory record status of cut circuit (OFF) incident
- DIN RAIL Installation.
- LED show Output Relay status.
- There are model with Auxiliary Supply (220VAC, 24VDC/VDC) and No Auxiliary Supply.

GENERAL DESCRIPTION

VPM-01-D is Voltage Protection that show and check electrical voltage in Digital which made the result is clear and accurate.

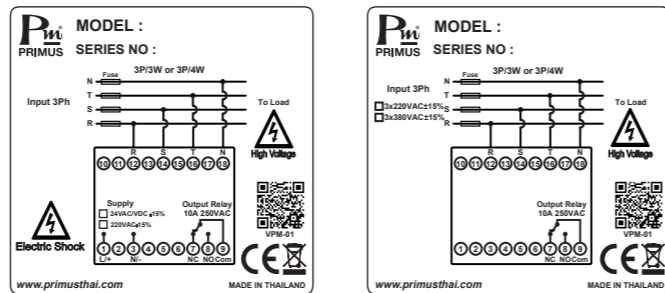
VPM-01-D will start and can set delay time before start since 1-3600 Sec. But if user set phase sequence do not correct. Relay will not operate and do not delay when start operate and detect irregular voltage if voltage over or under than value from setting or phase unbalance more than % from setting or phase loss Relay will command OFF in 0-3600 Sec. (Trip Delay Time) which can cutting fast or delay time when voltage level back to setting range. Relay will back to ON again in 0-3600 Sec.(Output ON Delay Time) from setting.

After VPM-01-D cut circuit or Relay OFF. It can call after VPM-01-D cut circuit or Relay OFF will can browse the cause of Relay OFF from Display page that Over-Under Voltage Unbalance or Phase Loss, Phase Sequence.

There are 2 type Auxiliary Supply made voltage measure range can measure in large range and No Auxiliary Supply by voltage that measure will be supply to VPM-01-D. It made measure range less than Auxiliary Supply.

% Unbalance or % of voltage each phase that difference can set 0.0-50.0 %

WIRING DIAGRAM



OPERATION DISPLAY

Voltage Status	Display Output	LED Signal	Fault Mem
Start Operation	0 Flash		
Normal	380 VAC		
Over Voltage	390 VAC	● OV	R_ou
Under Voltage	370 VAC	● UV	R_uu
Unbalance Phase	230 VAC	● UBL	R_ub
Phase Sequence	380 VAC	● PS	R_ps
Phase Loss	230 VAC	● PL	R_pl

% Unbalance Calculation

Unbalance Voltage Detection

This Function will check voltage value each phase compare with average 3 phase voltage have differences over than %Unbalance from setting or not. If it is over the device will delay 8 second then Output Relay will stop operation. %Unbalance will be follow as formula (1), (2) and (3).

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

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

V^{MD} Absolute value maximum of the difference voltage in each phase with average voltage.

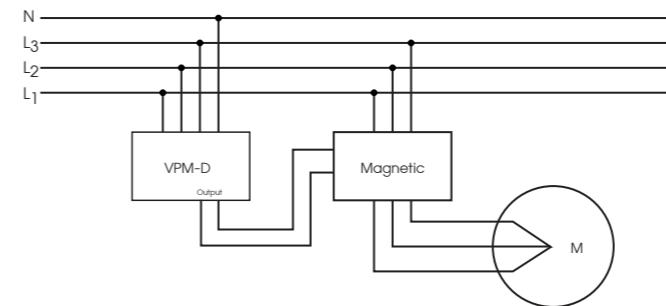
$$VMD = \text{Max} (|V_a - V_{avg}|, |V_b - V_{avg}|, |V_c - V_{avg}|) \quad (3)$$

Example $V_{avg} = 183V$. $V_a = 110V$. $V_b = 220V$. $V_c = 220V$.

$$|V_a - V_{avg}| = 73 \quad |V_c - V_{avg}| = 37V$$

$$|V_b - V_{avg}| = 37$$

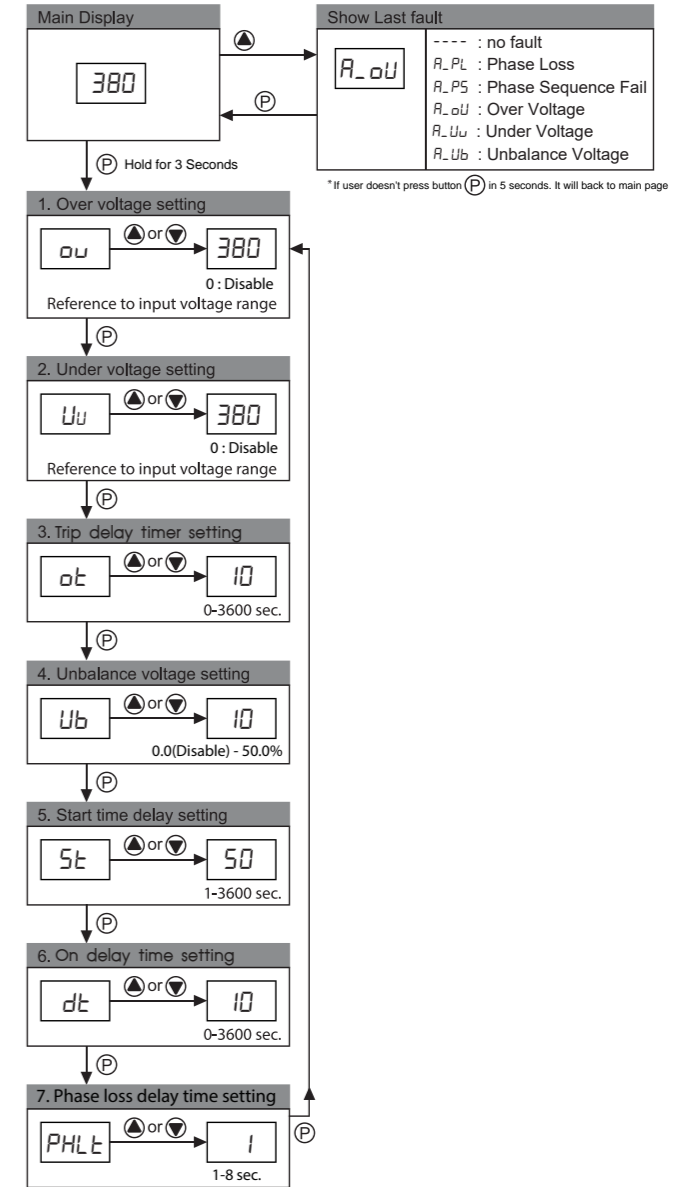
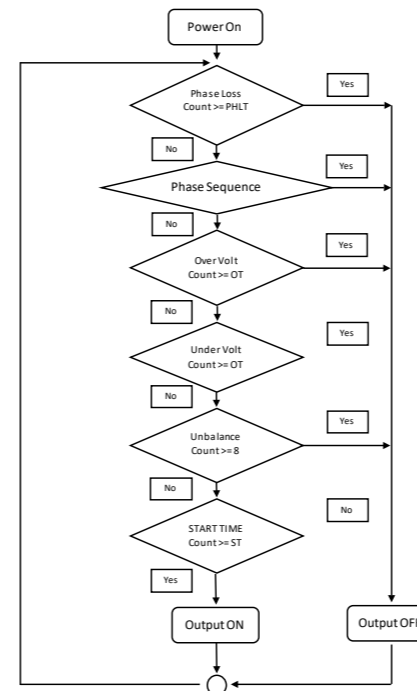
$$\% UBL = 100 \times \frac{73}{183} = 39.89\%$$



Remark

Check Phase Loss in 3P4W electrical system if there are Phase loss from breaker from source just 1 phase. It will made voltage back from to voltage measure point of meter. It made the Phase Loss in this case cannot check but can measure from Under Voltage or Unbalance by setting value which is suitable with work feild.

Flowchart Output Relay Operation



How to press Clear Start Time button

Press button (P) hold for 5 seconds after that it will Clear Start Time in that moment.

ORDERING CODE

VPM -	INPUT	POWER SUPPLY	- D -	Voltage Range
01	3 Phase AC Voltage	None Aux Supply 220VAC±15% 220 No. Aux Supply 380 No. Aux Supply		None 20-500V VAC(30) 5 0.5-5 VAC(30) *for Aux Supply 24VDC/VAC/±15% 50 5-50 VAC(30) *for Aux Supply 220VAC±15%

EX. VPM-01-380-D
 → Digital Display
 → means POWER SUPPLY : No Aux. Supply
 → means INPUT : 3 Phase AC Voltage



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