



Description

- Dry Run / Load Protection Relay : PM-007N is a device for protecting the Load of a Motor, such as a water pump, to prevent it from running empty without water, as this will cause damage to the pump. Or, it protects the gear of the Motor from being damaged when receiving a load that is greater than normal.
- Can select the display and protection in both PF (Cos ϕ) type or Ampere current type.
- Can be used with both 1 Phase Motor and 3 Phase Motor.
- Can be connected for use in direct connection type at maximum current of 40 A and connected for use together with external CT by setting the CT Ratio value according to the CT value being used.
- Input for receiving Start-Stop, Reset Alarm commands from various devices
- Start Delay Timer to delay the Start period and an Off Delay Timer 0-9999 Sec. to help during the Start.
- 7-Segment 4 LEDs Display.

Specification

Power Supply		90-450VAC
Power Consumption		3VA
Display		7 Segment 4 Digit
Input	Input Type	1 Phase/3 Phase 3 Wire
	Frequency Range	45-55 Hz
	PF Accuracy	± 0.01 -1.00
	Current Accuracy	$\pm 2\%$
	Input Current	0.1-40A (Direct) 2% of Primary-9999A (With External CT)
Digital Input	External Input (Start & Stop Motor)	Dry Contact
	Reset Input (Push Switch)	Dry Contact
Output	Maximum Rating	2 Relay
		5A. 250VAC/5A. 30VDC
Delay Timer	External Input (DI)	0-10 Sec.
	OFF Delay Time (DT)	0...9999 Sec.
	Start Time (ST)	0...9999 Sec.
	Recovery Time (RT)	0...9999 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		IP 30
Installation		DIN RAIL Mounting
Material		ABS-V0 (UL-94V)
Size (mm.)		95 x 80 x 50
Weight (kg.)		300

Operation

PM-007N, when the circuit is connected according to the Diagram and power is supplied to the PM-007N, the Relay Output will operate in order to start the motor's operation and the Start Delay timer. The PM-007N will perform the fault check after the Start Delay timer period has ended. The fault check can be selected in 2 types:

1. Check the fault of PF (Cos ϕ), suitable for use with 3 Phase Motor because in the change of the load's operation, the PF (Cos ϕ) will have a value change according to the load more than the current. For example, a water pump that has a low load (lacking water or no water) or a Motor's gear that has a high ratio and slow speed—most of the load, the gear will be the bearer of the burden. Therefore, when a fault occurs, the motor's current will hardly change, but the PF (Cos ϕ) will change clearly.

2. Fault detection via ampere current is suitable for use with single-phase motors. Since most single-phase motors are capacitor motors, checking the PF (Cos ϕ) may be inaccurate due to the capacitor connected in the circuit. The PM-007N allows the Relay Output to be configured with 3 operating functions as follows:

1. Under Protection: If the measured value falls below the Set Point Low (SP.Lo), the Relay Output will command the motor to stop after the set OFF Delay Time (DT). This function is suitable for applications such as water pumps, where it prevents dry-run conditions caused by a lack of water in the system, which can damage the pump.

2. Over Protection: If the measured value exceeds the Set Point High (SP.Hi), the Relay Output will command the motor to stop after the set OFF Delay Time (DT). This function is suitable for protecting gear systems with high gear ratios and low rotational speeds. When the gear mechanism is subjected to an excessive load, it may lead to gear damage.

3. Range Limit Protection: If the measured value is higher than the Set Point High (SP.Hi) or lower than the Set Point Low (SP.Lo), the Relay Output will command the motor to stop after the set OFF Delay Time (DT). This function is suitable for applications that require protection from both under and over conditions.

Ext. Input is provided to activate the PM-007N after the set External Input Time (DI). This allows the PM-007N to operate in coordination with a level switch or other switches used to control the pump.

Recovery Time (RT) range of 0-9999 seconds for setting the delay before the PM-007N resumes operation after a dry-run condition. For example, in a submersible water pump that draws groundwater, prolonged operation may cause the groundwater level to drop, resulting in a dry-run condition.

Operation

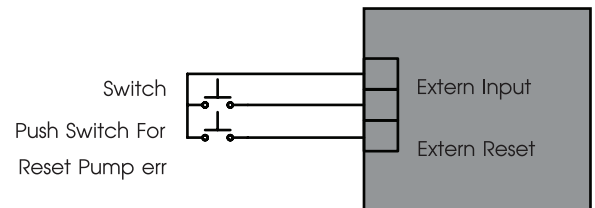
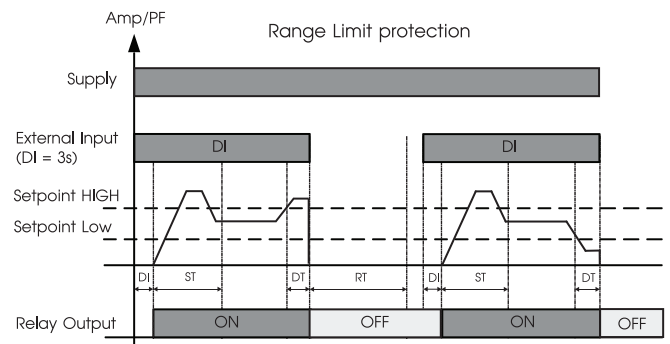
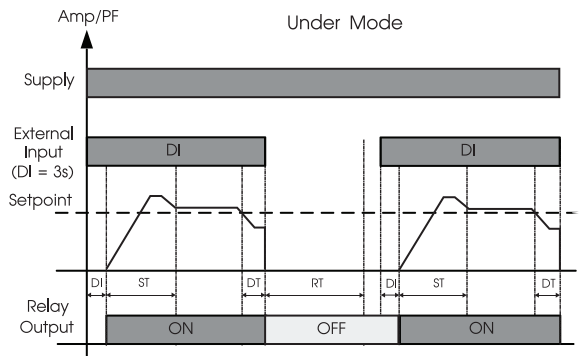
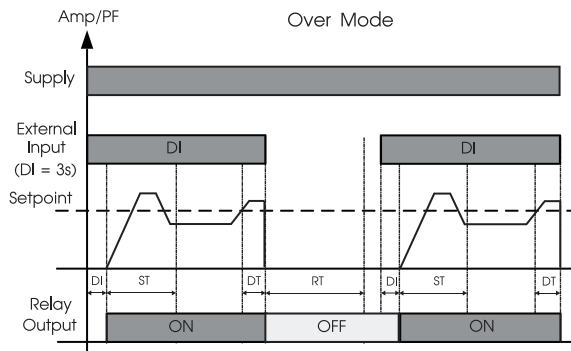
PM-007N will stop the pump when a dry-run occurs. If the Recovery Time (RT) is set to 30 minutes, the pump will automatically resume operation after 30 minutes. This is because the groundwater level will have increased after the pump stops. This function is useful as it eliminates the need to manually restart the pump.

if the Recovery Time (RT) is set to 0 minutes, this function will be disabled, and the user must perform a reset by pressing and holding the button for 3 seconds, or by resetting through the External Reset Input.

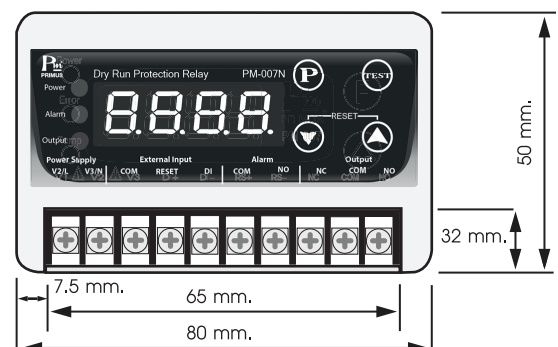
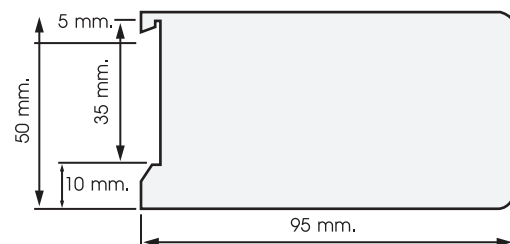
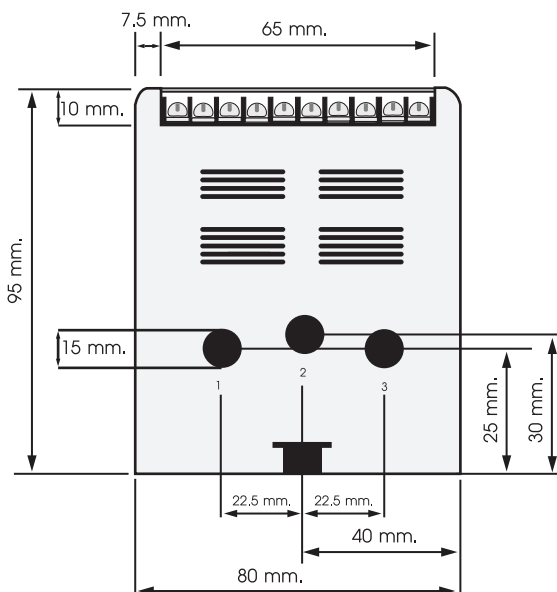
There is an External Reset Input for connecting to a push-button switch to reset the PM-007N and allow it to operate again. This is used in cases where you do not want the Auto Mode to start using the (RT) function.

There is an External Input Time (DI) for delaying the output from activating again after receiving an external input. This prevents the output from rapidly switching ON/OFF in cases where the level switch operates in an unstable manner.

PM-007N also features a Pump Test mode. By pressing and holding the Test button for 3 seconds, the PM-007N will display -tp-, and the output will operate continuously with no alarm monitoring. Pressing the Test button again will return the PM-007N to normal operation and the -tp- message will disappear. This function can be used to manually operate the pump in situations where other inputs are not functioning.



Wiring Diagram



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Diagram PM-007N (1 Phase Direct)

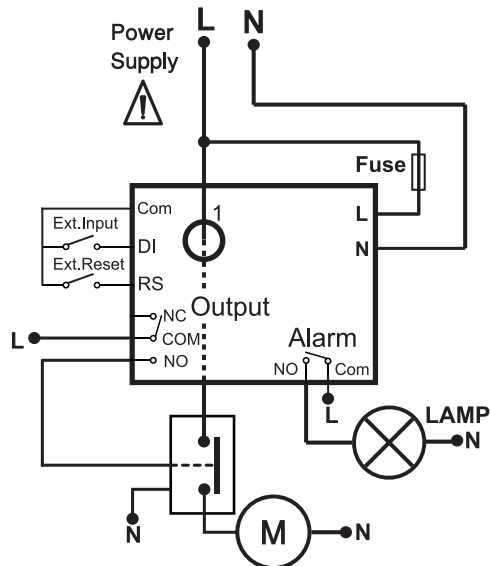


Diagram PM-007N (3 Phase Direct)

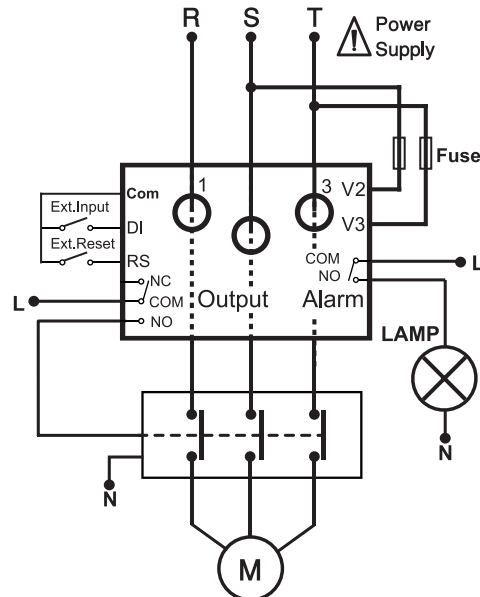


Diagram PM-007N (1 Phase With CT)

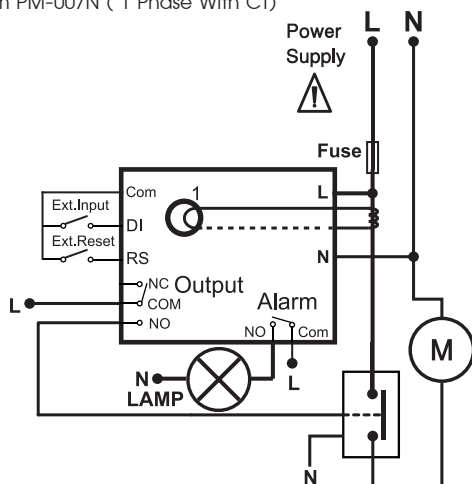
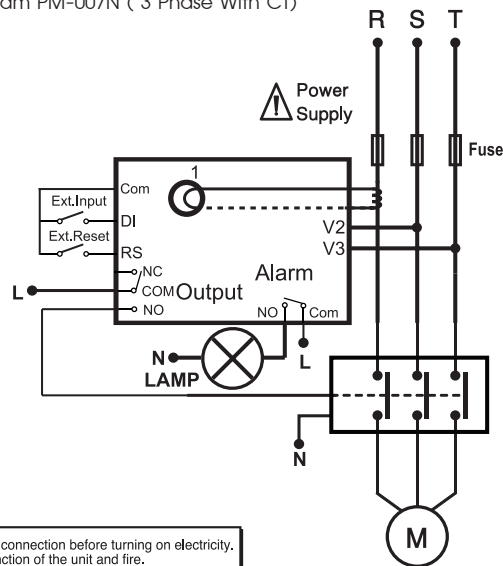


Diagram PM-007N (3 Phase With CT)



WARNING

- 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.

Ordering Code

PM-007N