



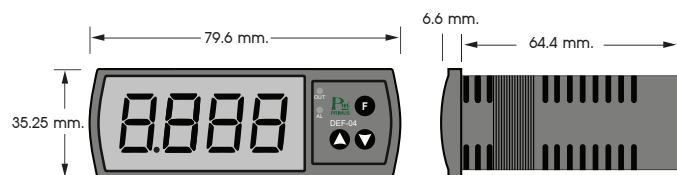
TECHNICAL SPECIFICATION (คุณสมบัติทางเทคนิค)

Power Supply		220 VAC ±15% 50/60 Hz
		10-28 VAC/VDC
Power Consumption		3VA
Display		7 Segment 4 Digit Size 0.39 Inch, 1 Row
Input	Input Type	TC Type K, J and PT 100
	Range	Please see detail in Table 1..
	Accuracy	± 0.2% of Full Scale @ Room Temp. (25 °C)
	Sampling Time	250 mSec
Output	Relay Output	1 Output 3A/250VAC
	Control Mode	Heating / Cooling
	Hysteresis	0 to 100 °C (ON/OFF)
	Relay Alarm	1 Alarm 3A/250VAC
Ambient	Temperature	-10 °C to 60 °C
Operation	Humidity	85 % RH Non-Condensing
Ambient	Temperature	-20 °C to 80 °C
Storage	Humidity	85 % RH Non-Condensing
Protection Degree	Front Protection Rating	IP52
	Case Protection Rating	IP30
Installation		Panel Mounting
Material		ABS-V0
Size		35.25 x 79.5 x 71 mm.
Weight		230 g.

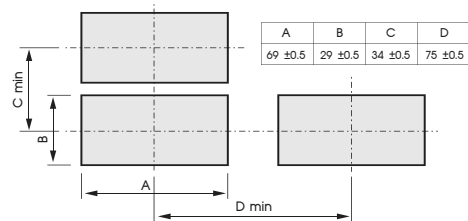
Table 1. Select input sensors and setting range.

Symbol	Input Type	Setting Range/Display Range	
		Non-decimal point	Decimal point
00	Thermocouple Type K	-200~1372 °C	-199.9~999.9 °C
		-328~2501 °F	-199.9~999.9 °F
01	Thermocouple Type J	-200~1200 °C	-199.9~999.9 °C
		-328~2192 °F	-199.9~999.9 °F
02	PT100	-200~850 °C	-199.9~850.0 °C
		-328~1562 °F	-199.9~999.9 °F

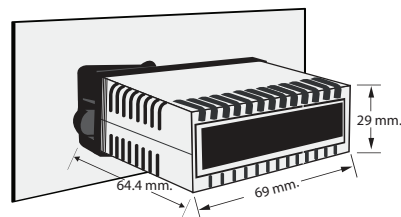
DIMENSION



CUTTING PANEL (การเจาะติดตั้ง)



INSTALLATION (การติดตั้ง)



DESCRIPTION

- DEF-04N is a digital controller and indicator that receives input signals from Thermocouple types K, J, and PT100 (RTD).
- 7-segment LED 4 digits for display.
- Temperature display range: Refer to Table 1.
- Allows setting the decimal point to one position.
- Compact size for installation on the limited front panel space.
- Equipped with one main relay that can be configured as either a control or alarm output, and one additional alarm relay (optional models only).
- Hysteresis time can be set from 0 to 99.59 minutes.
- Relay output can be configured for heating or cooling operation with hysteresis. The hysteresis value can be set in units or time.

OPERATION

The DEF-04N device is a temperature controller with a small and compact design. It features both heating and cooling control functions, as well as an alarm function. These functions can be configured to operate through a single main relay. For models with Option-B, an additional alarm relay is provided, allowing separate alarm operation in addition to the main relay.

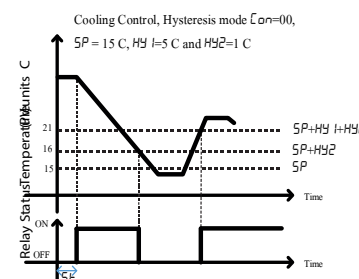
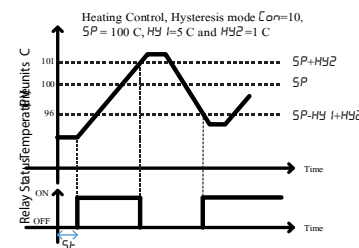
ON/OFF Control Operation

The ON/OFF control operation of the DEF-04N can be configured in two modes: Heating or Cooling. The ON/OFF control also allows the selection of two control mode patterns.

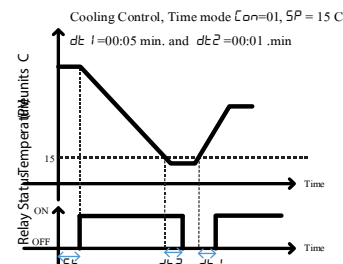
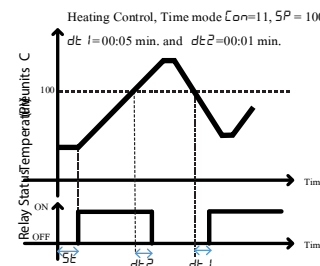
- Hysteresis Mode sets the difference (or gap) between the ON and OFF states. The unit can be in either °C or °F, and the setting range is from 0 to 100. The operation of this function is illustrated in Picture 1.
- Time Mode sets the ON delay time (dt1) and OFF delay time (dt2) at the setpoint value (SP). The unit for both times is in minutes (min), and the setting range is from 00:00 to 99:59. The two digits before the decimal point represent the number of minutes (00 to 99), while the two digits after represent seconds (00 to 59). The operation of this function is illustrated in Picture 2

During operation, users can configure the Start Delay Time in minutes to delay the activation of the Main Relay and Alarm Relay upon initial power-up. This function helps protect ON/OFF actuators from operating too quickly, which can occur in cases such as sudden ON/OFF cycling or voltage drops. Such conditions may cause the actuator to switch ON/OFF abruptly, potentially resulting in damage to equipment like compressors or heaters.

The Start Delay Time can be set from 00.01 to 99.59 minutes. The first two digits before the decimal point represent the minutes (ranging from 00 to 99), and the two digits after the decimal point represent the seconds (ranging from 00 to 59). If the minute value is greater than 0, the second value can be set from 00 to 59. However, if the minute value is 0, the second value must be set from 01 to 59.



Picture 1 show the ON/OFF Controller operation in Hysteresis mode



Picture 2 shows ON/OFF Controller operation by time is Hysteresis in minute unit.

Alarm System Operation

The alarm operation system allows the user to choose from 8 alarm modes, which can be classified into two main types of operation.

- Deviation Mode, where the alarm is triggered based on the deviation from the setpoint value (SP). There are four subtypes within this mode: High-Low Alarm, High Alarm, Low Alarm, and High-Low Range Alarm. For example, if the SP is set to 100 °C and the user selects High Alarm mode (FU = 2) with a High Alarm Limit (Hi) set to 10, the alarm relay will be activated when the temperature exceeds 110 °C. If the user later changes the SP to 120 °C, the alarm will instead trigger at 130 °C

Changing the Setpoint Value (SP) to 120 °C will cause the Alarm Relay to activate when the temperature exceeds 130 °C. For further details, please refer to the Alarm Function Table.

- Absolute Mode, the alarm trigger value is independent of the setpoint value (SP). The alarm operates based on a fixed temperature threshold defined by the user, without any calculation involving the SP. There are four alarm types available in this mode: High-Low Alarm, High Alarm, Low Alarm, and High-Low Range Alarm. For example, if the SP is set to 100 °C and the user selects High Alarm mode (FU = 6) with the High Alarm Limit (Hi) set to 110 °C, the alarm relay will activate when the temperature exceeds 110 °C. If the SP is later changed to 120 °C, the alarm relay will still operate at 110 °C, as it is based on the fixed alarm limit, not the SP value. For more details, refer to the section Alarm Output.

Main Relay and Alarm Relay Function Selection

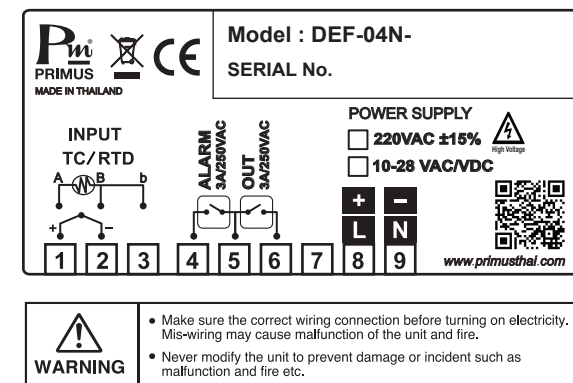
DEF-04N can be configured to operate in either ON/OFF Control Mode or Alarm Function Mode for the Main Relay, the relay functions can be selected as follows:

- The DEF-04N-A has only one Main Relay, allowing you to select the operation mode, which can be either Output or Alarm Function. There are 4 Absolute Alarm types: Absolute High-Low Alarm, Absolute High Alarm, Absolute Low Alarm, and Absolute High-Low Range Alarm.
- The DEF-04N-A-B has both a Main Relay and an Alarm Relay, allowing you to select the operation mode.

2.1 In the case where the Main Relay is set to Output Function, you can choose between Heat or Cooling control, allowing the Alarm Relay to have a total of 8 operation modes, including Deviation and Absolute alarms, as shown in the Alarm Function Table.

2.2 In the case where the Main Relay is set to Alarm Function, both the Main Relay and the Alarm Relay can have a total of 4 operation modes, which are Absolute Alarms as shown in the Alarm Function Table.

WIRING DIAGRAM

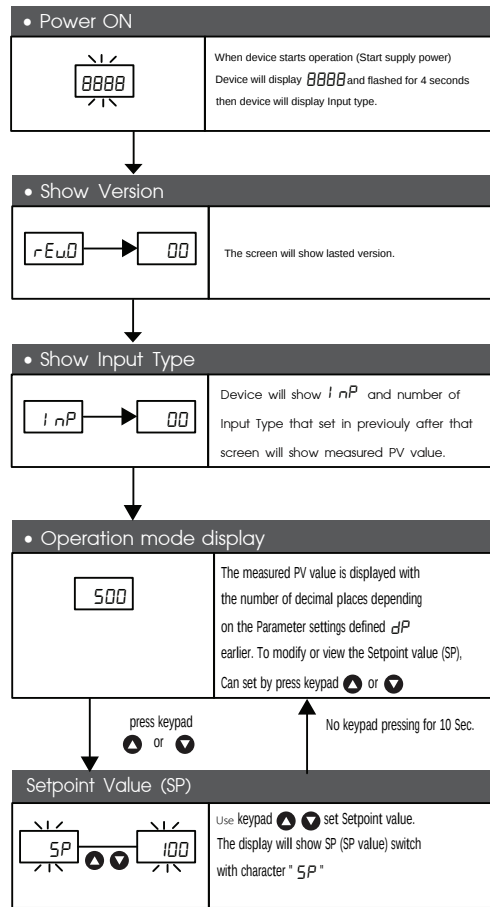


ORDERING CODE

DEF -04N- A-	B	-	
		CODE	SUPPLY
		24	10-28 VAC/VDC
		220	220 VAC ±15%
		CODE	OPTION
		B	Alarm

... Remark

A=1 Output Relay /Alarm
Standard model



■ ALARM OUTPUT : Process value (PV) to be used as Alarm Output.

Stand-by sequence : After starting operation of step, alarm output does not turn on unless the process value reach the value of OFF position of alarm output.

