



DEF-03

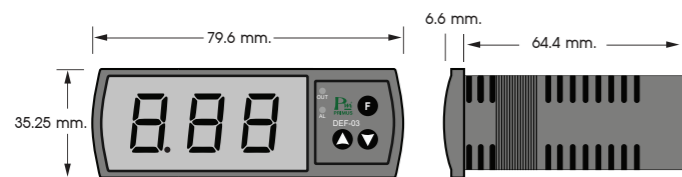
**TECHNICAL SPECIFICATION**

Power Supply	220 VAC ±10% 50/60 Hz	
Power consumption	3 VA	
Display	7 Segment Size 0.39 Inch, 3 Digit	
Input	Input Type	PTC, NTC
	Range	Please see detail in Table 1.
	Accuracy	± 0.1% of Full Scale @ Room Temp. (25 °C)
	Sampling Time	250 mSec / 0.25 Sec
Output	Relay Output	1 Output 3A/250VAC
	Output Function	Heating / Cooling
	Hysteresis	0 to 100 °C (ON/OFF)
	Relay Alarm	1 Alarm 3A/250VAC
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	Front Protection Rating	IP52
	Case Protection Rating	IP30
Installation	Pannel Mounting	
Material	ABS-V0	
Size	33.25 x 79.6 x 71 mm.	
Weight	230 g.	

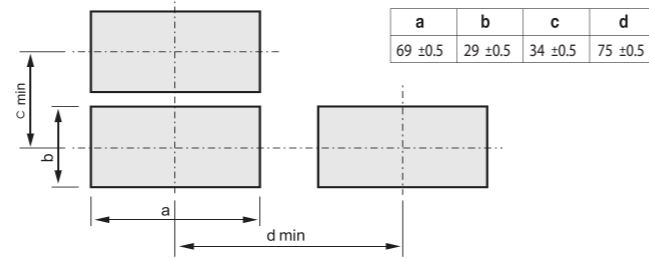
Table 1. Select input sensors and setting range.

Symbol	Input Type	Setting Range/Display Range	
		Non-decimal point	Decimal point
00	PTC 2K @ 25 °C	-40~130 °C	-19.9~99.9 °C
		-40~266 °F	-19.9~99.9 °F
01	PTC 10K @ 25 °C	-40~130 °C	-19.9~99.9 °C
		-40~266 °F	-19.9~99.9 °F
02	NTC 2K @ 25 °C	-40~130 °C	-19.9~99.9 °C
		-40~266 °F	-19.9~99.9 °F
03	NTC 10K @ 25 °C	-40~130 °C	-19.9~99.9 °C
		-40~266 °F	-19.9~99.9 °F

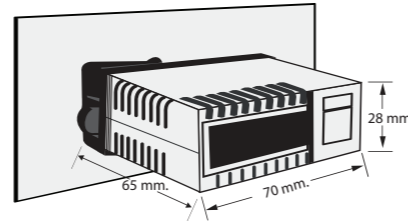
**DIMENSION**



**CUTTING PANEL**



**INSTALLATION**



**DESCRIPTION**

- DEF-03 is digital controller and indicator. Receive Input from NTC/PTC.
- Display by 7-Sagment LED 3 Digits.
- Temperature range as table 1.
- Can set Decimal Point 1 position.
- Small and compact size suite for limited area in cabinet box.
- Main Relay 1 set can choose that it will operate as Control/Alarm has 1 Alarm Relay (Option model only).
- Hysteresis Time start operation at 0-9.59 min .
- Relay Output choose operation both Heating and Cooling, Hysteresis set to be Unit value or Time.

**OPERATION**

DEF-03N is Temperature Controller that has small and compact size control by ON/OFF Control can choose 2 type operation are Heating are Heating/Cooling Function and Alarm Function can choose to use in one Main Relay. And for the model that choused Option-B. It will has Alarm relay.

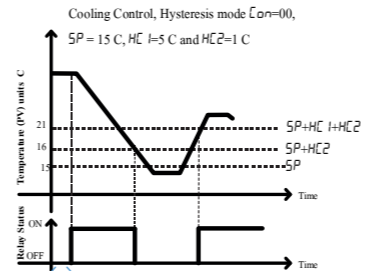
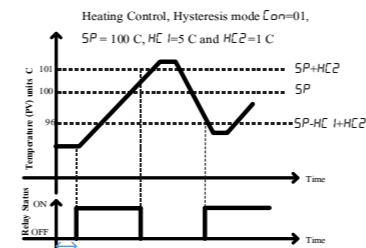
**การทำงานควบคุมแบบ ON/OFF Control**

Control the operation by ON/OFF Control of DEF-03N can choose controlling 2 type are Heating/Cooling and ON/OFF control. We can set the form of Control Mode 2 type are

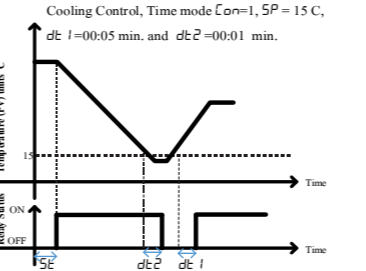
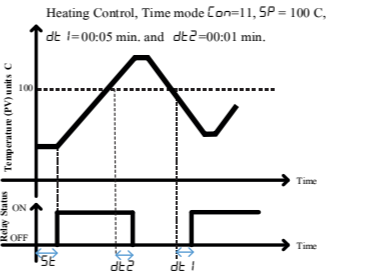
- Hysteresis Mode is distance value between ON and OFF. This mode has unit is °C or °F set since 0-100. The operation of this function as pic.1
- Time Mode use to delay Time ON( $dt1$ ) and Time OFF( $dt2$ ) at Setpoint Value( $SP$ ) has unit in minute (min) can set since 0 to 9.95 minute. The number before decimal point is minute can set since 0 to 99 and number after decimal point is second can set since 00 to 59 the operation of this function show as picture 2.

User can set Start Delay Time has unit in minute for delay time to the operation of Main Relay and Relay Alarm in ON time phase for protecting ON/OFF Actuator too fast such as in case on or off the device suddenly or electrical drop which can ON/OFF suddenly and affect to Compressor or heater broken.

Start Delay Time can set since 0 to 9.59 minute by the two digits number before decimal point is minute. It can set 0 to 9 and number 2 digits after decimal point is seconds it can set since 00 to 59.



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



Picture 2 show the operation of ON/OFF Controller by using time to be Hysteresis has minute is minute.

**Alarm Operation**

Alarm system operation user can choose function all 8 function. by showing the operation as picture 3. It can classify operation 2 type as follow :

- Deviation the value that use in decide operation of Alarm will relate to Setpoint Value ( $SP$ ) sort of 4 pattern are High-Low Alarm High Alarm, Low Alarm and High-Low Range Alarm.

Example such as set  $SP = 100^{\circ}C$  choose High alarm ( $FU=2$ ) and High alarm limit ( $H_i$ ) equal to 10 it will made Alarm Relay operate when temperature more than  $100^{\circ}C$  if user change  $SP$  to  $120^{\circ}C$  it will made Alarm Relay operate when the temperature more than  $130^{\circ}C$ . The detail look at Table Alarm Function.

2. Absolute the value that use for decide alarm operation will isolate from Setpoint Value ( $SP$ ) or this is temperature value setting for cut or connect the Relay operation by not include  $SP$  value to calculate by separate to 4 type are High-Low Alarm, High Alarm, Low Alarm example such as set  $SP=100^{\circ}C$  choose High Alarm ( $FU=6$ ) and Alarm High Limit( $H_i$ ) equal to  $110^{\circ}C$  will made Alarm Relay operate when temperature more than  $110^{\circ}C$ . If user changes  $SP$  value to  $120^{\circ}C$  it will make Alarm Relay still operate at  $110^{\circ}C$  as normal. The detail look at Alarm Output topic.

**How to choose Operation Function of Main Relay and Alarm Relay**

Because Relay of DEF-03N can choose the operation between ON/OFF Control or Alarm Function for main Relay make Relay operation can choose by

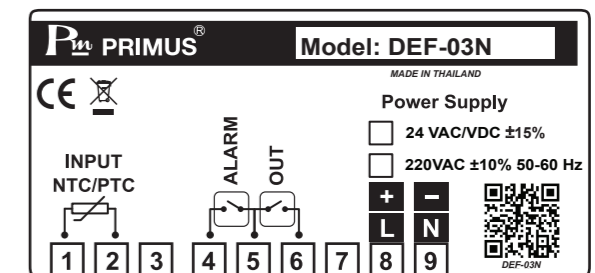
1. DEF-03N-A has Main Relay just one device it made user can choose the operation is Output or Alarm Function in Absolute mode 4 type are Absolute High-Low Alarm, Absolute High Alarm, Absolute Low Alarm and Absolute High-Low Range Alarm.

2. DEF-03N-A-B has Main Relay and Alarm Relay can choose the operation are

2.1 In case Main Relay is Output Function can choose and control in Heating or Cooling mode it made Alarm Relay can choose the operation all 8 mode are Deviation and absolute alarm follow Table Alarm Function.

2.2 In case Main Relay is Alarm Function can choose it will made both Main Relay and Alarm Relay can choose the operation all 4 type are Absolute Alarm follow Table Alarm Function.

**WIRING DIAGRAM**



**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.

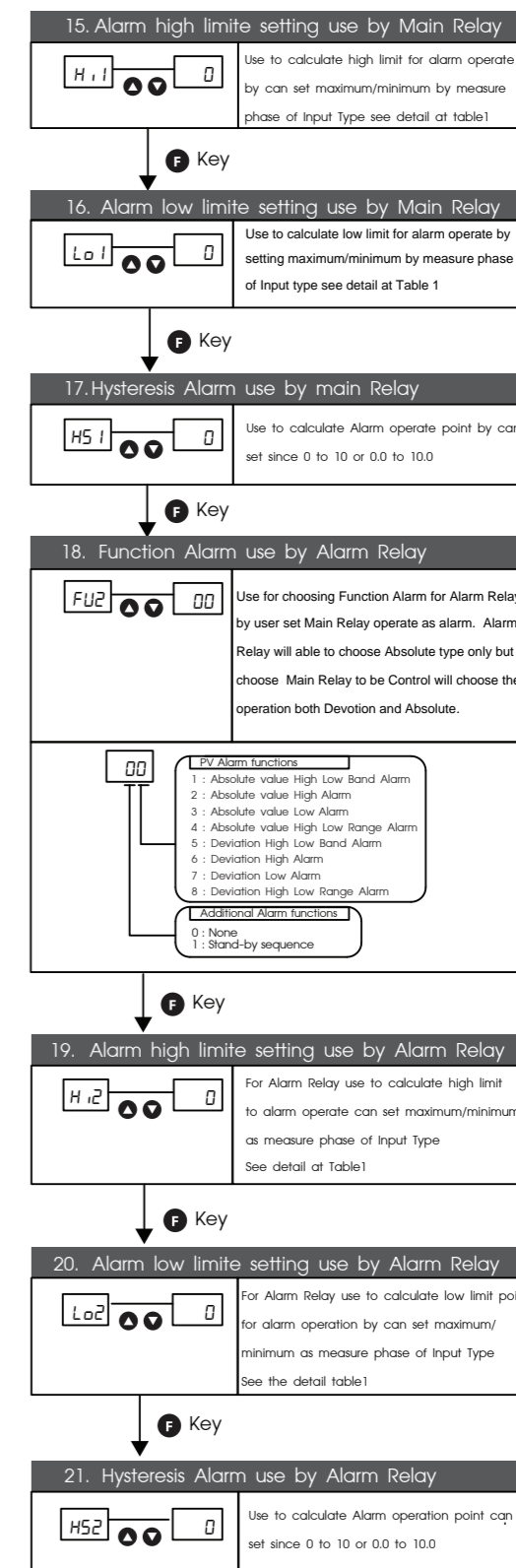
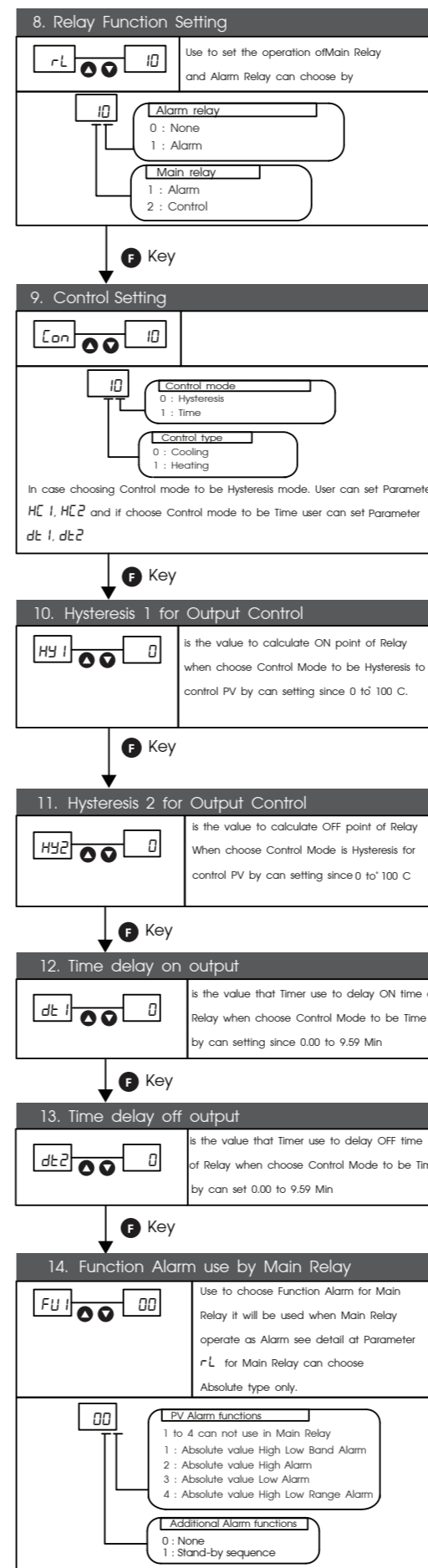
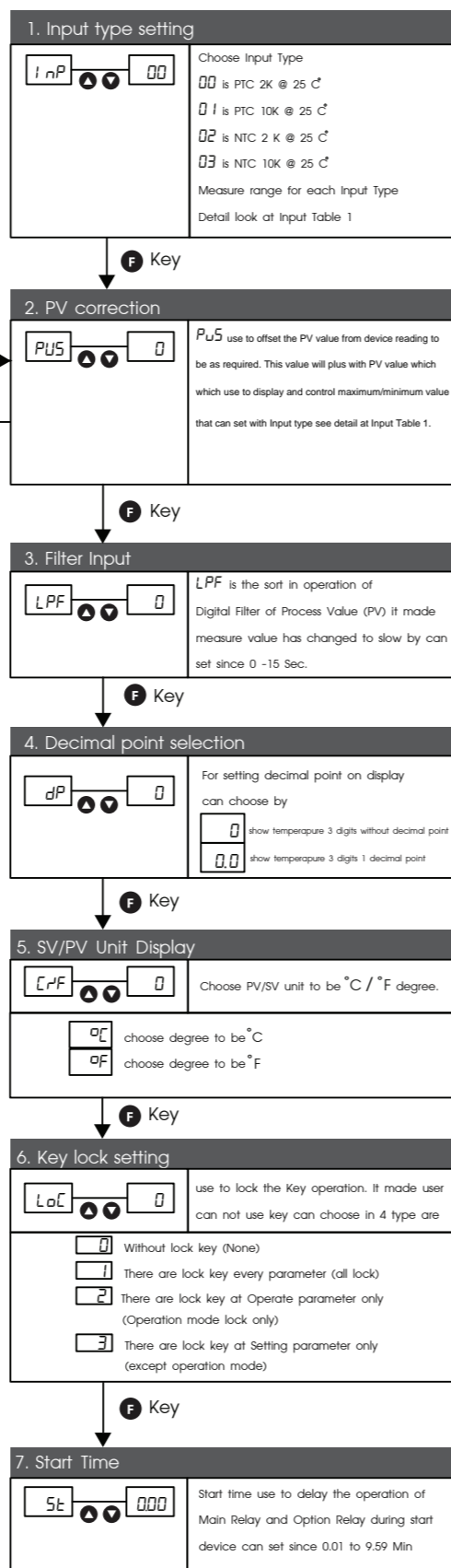
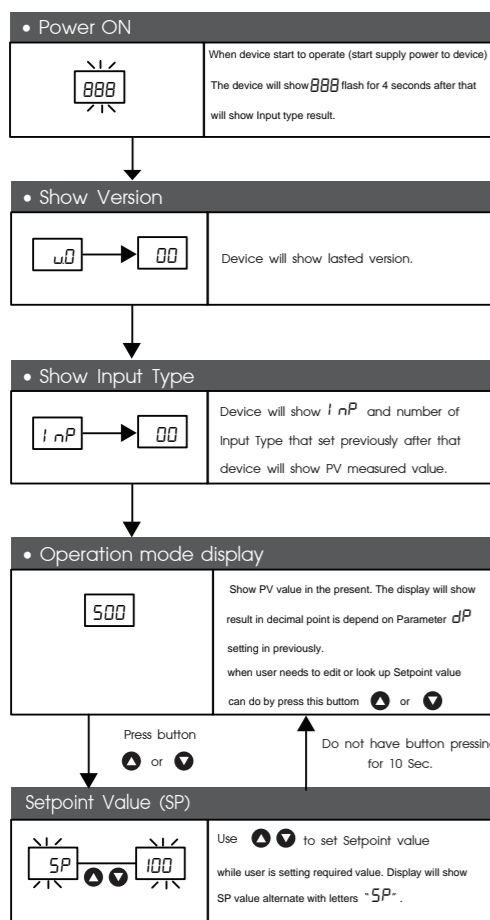
**ORDERING CODE**

DEF -03N- A- [ ] - [ ]

CODE	SUPPLY
24	24 VAC/VDC ±15%
220	220 VAC ±10% 50-60 Hz

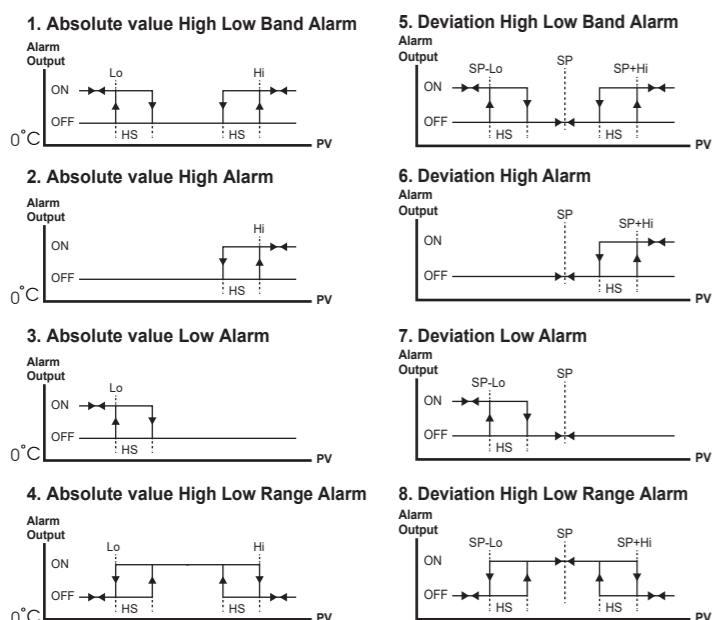
\*\*\*Remark  
A=1 Output Relay /Alarm model Standard

CODE	OPTION
B	Alarm



### 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.



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