CE ISO 9001 ISO 14001

CONOTEC
CONOTEC CO., LTD.

Digital Temperature Controller
www.conotec.co.kr

Manual *DSFOX - GH30*

- A user manual for this product is posted on the company website.
- Please download the technical document and communications manual on the company website.
☞ www.conotec.co.kr

1 Safety precautions

Please read the safety precautions carefully for correct operation of the product.
※ The specifications and dimensions specified in this instruction manual may be changed without any notice for performance enhancement.

⚠ Warning

1. This product was not made as a safe device. Therefore, this product should be attached with dual safety devices if it is used for the control purposes (e.g. a device vulnerable to accident and property damage, etc.).
2. Do not wire, inspect or service this product while the power is being supplied.
3. You must attach this product to a panel. Otherwise, it may cause an electric shock.
4. When connecting the power, you must check the terminal number.
5. Do not ever disassemble, process, modify or repair this product.

⚠ Caution

1. Please make yourself familiar with all the operation instructions, safety precautions and warnings before using this product. Comply with related specifications and capacity requirements
2. Do not wire or install this product to any unit with high inductive load (e.g. motor, solenoid, etc.).
3. Use a shielded cable with a proper length when extending a sensor.
4. Do not use any part that generates an arc when used in the same power or directly switched in close proximity.
5. Keep the power cable away from a high-voltage cable and do not install this product in any place that is full of water, oil and dust.
6. Do not install this product in any place that is exposed to direct sunlight or rain.
7. Do not install this product in any place that is subject to strong magnetic power, noise, vibration or shock.
8. Keep this product away from any place that generates strong alkaline or acid substances. Use a separate pipe.
9. Do not sprinkle water onto this product for cleaning when installing it in the kitchen.
10. Do not install this product in any place where the temperature/ humidity ratings are exceeded
11. The sensor cable should not be cut or cracked.
12. Keep the sensor cable away from a signal cable, a power cable or a load cable. Use a separate pipe.
13. Keep in mind that the follow-up service will not be available if this product has been arbitrarily disassembled and modified
14. ⚠ symbol on the terminal wiring diagram indicates a safety statement that alerts a warning or caution.
15. Do not use this product near any device generating strong high-frequency noise (e.g. high-frequency welding machine high-frequency sewing machine, high-frequency radio, large-capacity SCR controller, etc.).
16. Using this product in any method other than those specified by the manufacturer may lead an injury or a property damage
17. This product is not a toy. Keep it away from children

18. This product should be installed only by an expert or a qualified person.
19. The company will not be liable for any damage caused by the violation of the above warnings and cautions or by a consumer's fault

⚠ Danger

■ Caution: Risk of electric shock
- Electric shock – Do not touch the AC terminal while the current is flowing. It may cause an electric shock.
- You must disconnect the input power when servicing it.

2 Model types

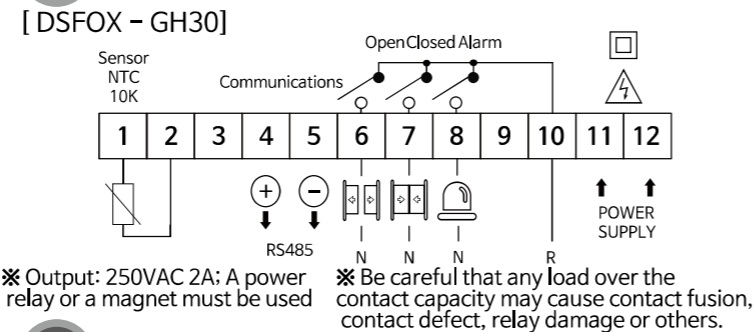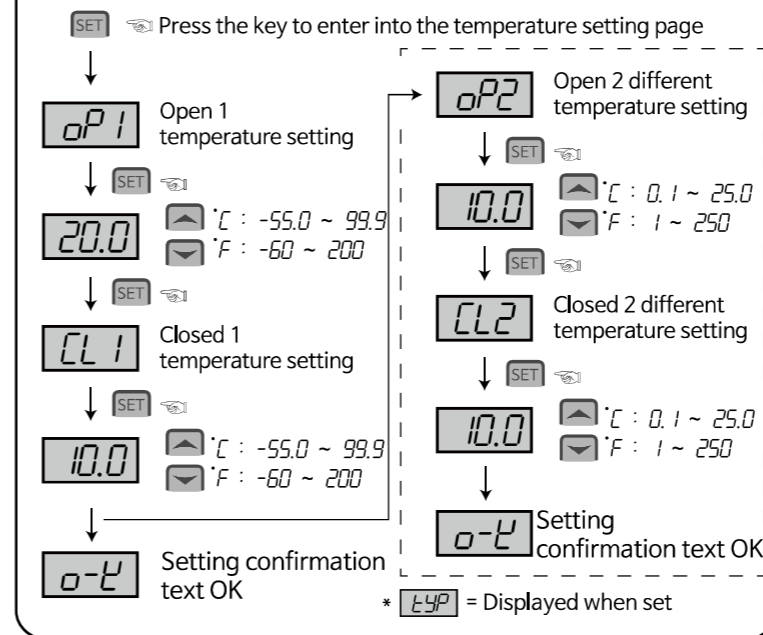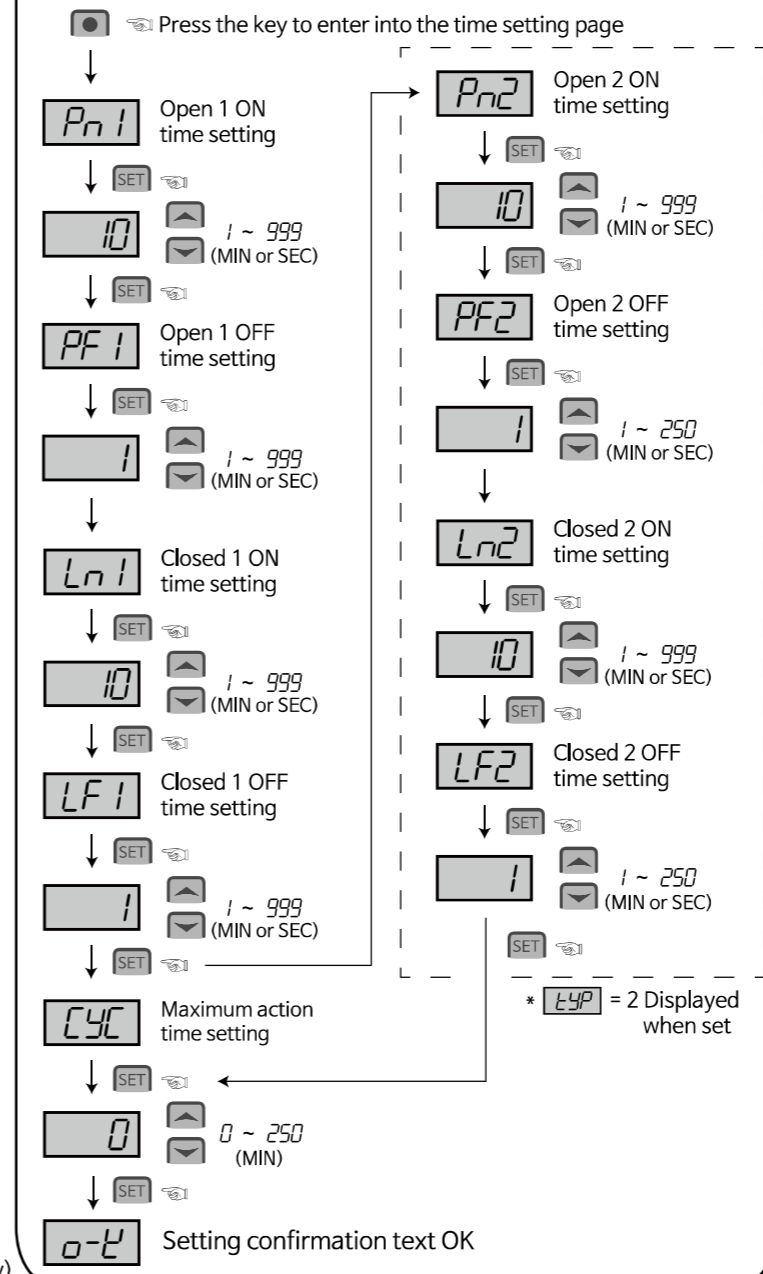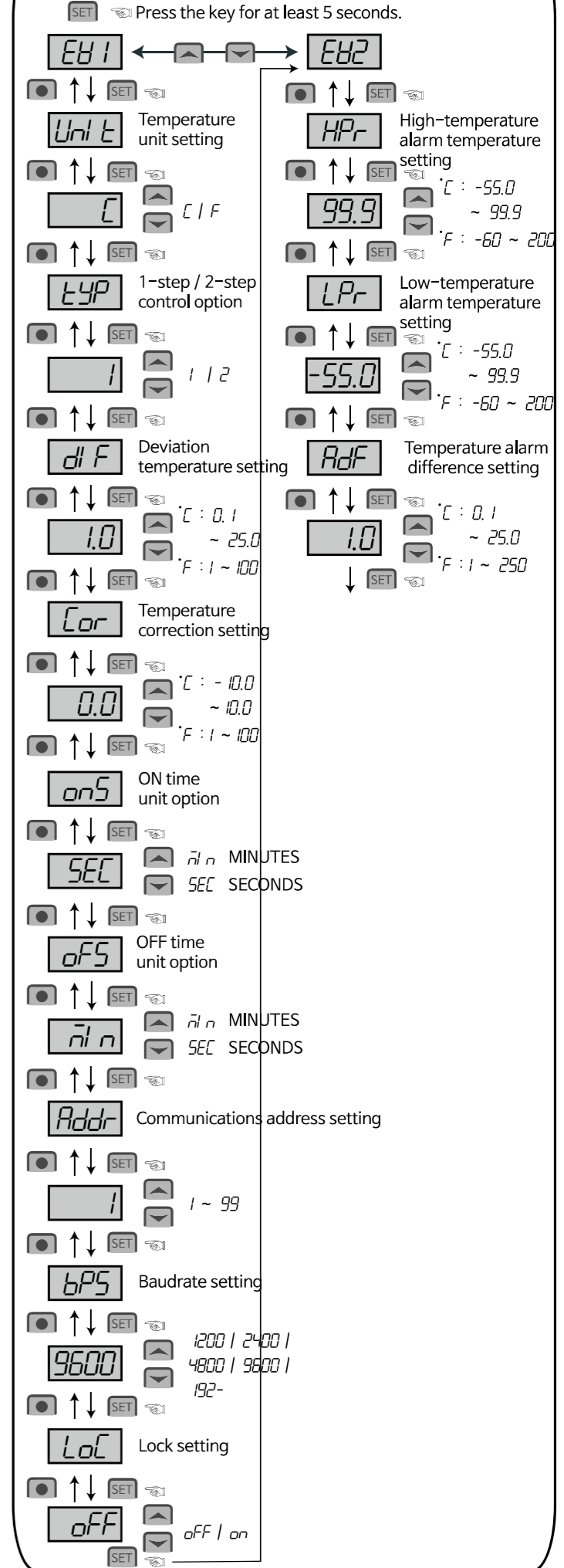| Model	Sensor	Control type	Temperature range	Power	Function
DSFOX-GH30 (for greenhouse)	NTC 10K	Relay contact (3EA)	Cel sius: −55.0 ~ +99.9 ℃ / Fahr enheit:−60 ~ +200 °F	100~240 VAC 50/60Hz	Open output Closed output Alarm output 485 communications

3 Components

■ Product appearance and components

1 Open state display
2 Closed state display
3 OUT output display
4 Alarm output display
5 Temperature setting switch
6 Time setting & Back switch
7 Up switch
8 Down switch
10 Minute display
11 Second display
9 Temperature unit

4 Terminal wiring diagram

[DSFOX – GH30]

Sensor NTC 10K
Communications
Open Closed Alarm
RS485
POWER SUPPLY

※ Output: 250VAC 2A; A power relay or a magnet must be used
※ Be careful that any load over the contact capacity may cause contact fusion, contact defect, relay damage or others.

5 Setting process

■ Setting method

명칭	이미지	내용
Temperature setting key	SET	Change of temperature/program settings Selection and saving of data values
Time setting & Back key	●	Change of time settings Go to the previous menu when setting up a program
Up/down key	▲ / ▼	Increment/decrement of the selected menu data

■ Temperature setting and time setting
1) If you press the SET key once, the setting will blink and be displayed (temperature setting)
2) If you press the ● key once, the setting will blink and be displayed (time setting).

■ Installer mode settings (Program setting)
1) Press the SET key for at least 5 seconds to enter into the installer mode.
2) Configure the program based on the temperature program configuration diagram.
3) Press ● key for Enter the previous setting menu(* Program setting mode only)

Temperature setting

SET 🖙 Press the key to enter into the temperature setting page

oP1 Open 1 temperature setting
SET 🖙
20.0 ▲▼ ℃ : -55.0 ~ 99.9 / °F : -60 ~ 200
SET 🖙
CL1 Closed 1 temperature setting
SET 🖙
10.0 ▲▼ ℃ : -55.0 ~ 99.9 / °F : -60 ~ 200
SET 🖙
o-V Setting confirmation text OK

oP2 Open 2 different temperature setting
SET 🖙
10.0 ▲▼ ℃ : 0.1 ~ 25.0 / °F : 1 ~ 250
SET 🖙
CL2 Closed 2 different temperature setting
SET 🖙
10.0 ▲▼ ℃ : 0.1 ~ 25.0 / °F : 1 ~ 250
SET 🖙
o-V Setting confirmation text OK

* typ = Displayed when set

Time Setting

● 🖙 Press the key to enter into the time setting page

Pn1 Open 1 ON time setting
SET 🖙
10 ▲▼ 1 ~ 999 (MIN or SEC)
SET 🖙
PF1 Open 1 OFF time setting
SET 🖙
1 ▲▼ 1 ~ 999 (MIN or SEC)
↓
Ln1 Closed 1 ON time setting
SET 🖙
10 ▲▼ 1 ~ 999 (MIN or SEC)
SET 🖙
LF1 Closed 1 OFF time setting
SET 🖙
1 ▲▼ 1 ~ 999 (MIN or SEC)
SET 🖙
CYC Maximum action time setting
SET 🖙
0 ▲▼ 0 ~ 250 (MIN)
SET 🖙
o-V Setting confirmation text OK

Pn2 Open 2 ON time setting
SET 🖙
10 ▲▼ 1 ~ 999 (MIN or SEC)
SET 🖙
PF2 Open 2 OFF time setting
SET 🖙
1 ▲▼ 1 ~ 250 (MIN or SEC)
↓
Ln2 Closed 2 ON time setting
SET 🖙
10 ▲▼ 1 ~ 999 (MIN or SEC)
SET 🖙
LF2 Closed 2 OFF time setting
SET 🖙
1 ▲▼ 1 ~ 250 (MIN or SEC)
SET 🖙

* typ = 2 Displayed when set

Program setting

SET 🖙 Press the key for at least 5 seconds.

EV1 ◀ ▲ ▼ ▶ EV2

● ↑↓ SET 🖙
Unit Temperature unit setting
▲▼ C I F
● ↑↓ SET 🖙
C
● ↑↓ SET 🖙
tYP 1-step / 2-step control option
▲▼ 1 I 2
● ↑↓ SET 🖙
1
● ↑↓ SET 🖙
diF Deviation temperature setting
▲▼ ℃ : 0.1 ~ 25.0 / °F : 1 ~ 100
● ↑↓ SET 🖙
1.0
● ↑↓ SET 🖙
Cor Temperature correction setting
▲▼ ℃ : -10.0 ~ 10.0 / °F : 1 ~ 100
● ↑↓ SET 🖙
0.0
● ↑↓ SET 🖙
onS ON time unit option
▲▼ ñln MINUTES / SEC SECONDS
● ↑↓ SET 🖙
SEC
● ↑↓ SET 🖙
oFS OFF time unit option
▲▼ ñln MINUTES / SEC SECONDS
● ↑↓ SET 🖙
ñln
● ↑↓ SET 🖙
Addr Communications address setting
▲▼ 1 ~ 99
● ↑↓ SET 🖙
1
● ↑↓ SET 🖙
bPS Baudrate setting
▲▼ 1200 I 2400 I 4800 I 9600 I 192-
● ↑↓ SET 🖙
9600
● ↑↓ SET 🖙
LoC Lock setting
▲▼ oFF I on
● ↑↓ SET 🖙
oFF
SET 🖙

HPr High-temperature alarm temperature setting
▲▼ ℃ : -55.0 ~ 99.9 / °F : -60 ~ 200
● ↑↓ SET 🖙
99.9
● ↑↓ SET 🖙
LPr Low-temperature alarm temperature setting
▲▼ ℃ : -55.0 ~ 99.9 / °F : -60 ~ 200
● ↑↓ SET 🖙
-55.0
● ↑↓ SET 🖙
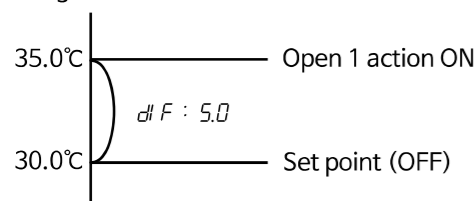AdF Temperature alarm difference setting
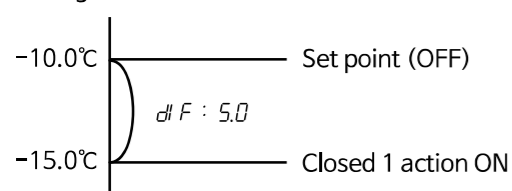▲▼ ℃ : 0.1 ~ 25.0 / °F : 1 ~ 250
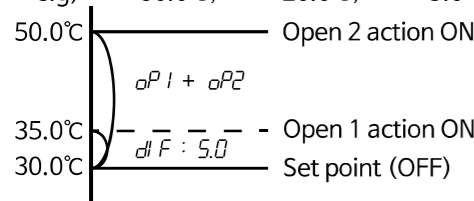● ↑↓ SET 🖙
1.0
SET 🖙

6 Function details

EH1 : Modification of various settings for temperature output, communications and others

EH2 : Modification of various settings for alarm

oP1 : Open 1 temperature setting
- Active when the current temperature is higher than the set temperature (oP1)
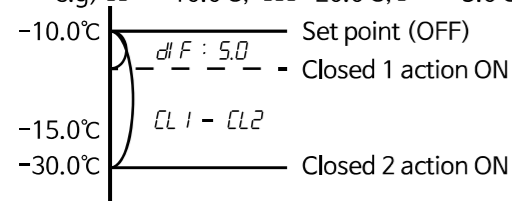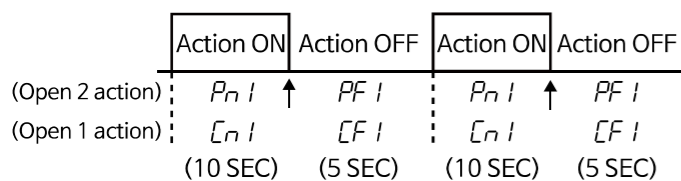- e.g) oP1: 30.0℃, dIF : 5.0℃, tYP : 1

35.0℃ ─── Open 1 action ON
dIF : 5.0
30.0℃ ─── Set point (OFF)

CL1 : Closed 1 temperature setting
- Active when the current temperature is lower than the set temperature (CL1)
- e.g) CL1: −10.0℃, dIF : 5.0℃, tYP : 1

−10.0℃ ─── Set point (OFF)
dIF : 5.0
−15.0℃ ─── Closed 1 action ON

oP2 : Open 1 temperature setting
- Active when the current temperature is higher than the set temperature (oP1 + oP2)
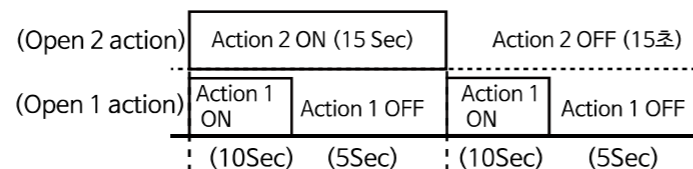- e.g) oP1: 30.0℃, oP2: 20.0℃, dIF : 5.0℃, tYP : 2

50.0℃ ─── Open 2 action ON
oP1 + oP2
35.0℃ ─── Open 1 action ON
dIF : 5.0
30.0℃ ─── Set point (OFF)

CL2 : CL2: Closed 2 temperature setting
- Active when the current temperature is lower than the set temperature (CL1 − CL2)
- e.g) CL1: −10.0℃, CL2: 20.0℃, dIF : 5.0℃, tYP : 2

−10.0℃ ─── Set point (OFF)
dIF : 5.0
─── Closed 1 action ON
CL1 − CL2
−15.0℃
─── Closed 2 action ON
−30.0℃

Pn1 : Open 1 action ON time setting
- Output ON time if the open 1 temperature setting (oP1) conditions are met

PF1 : Open 1 action OFF time setting
- Output OFF time when the open 1 action ON (Pn1) time elapses

Ln1 : Closed 2 action ON time setting
- Output ON time if the closed 2 temperature setting (CL1) conditions are met

LF1 : Closed 2 action OFF time setting
- Output OFF time when the closed 2 action ON (Ln1) time elapses
- e.g) Pn1 or Ln1 : 10 SEC, PF1 OR LF1 : 5 SEC

	Action ON	Action OFF	Action ON	Action OFF
(Open 2 action)	Pn1	PF1	Pn1	PF1
(Open 1 action)	Cn1	CF1	Cn1	CF1
	(10 SEC)	(5 SEC)	(10 SEC)	(5 SEC)

Pn2 : Open 2 action ON time setting
- Output ON time if the open 2 temperature setting (oP1+ oP2) conditions are met

PF2 : Open 2 action OFF time setting
- Output OFF time when the open 2 action ON (Pn2) time elapses

Ln2 : Closed 2 action ON time setting
- Output ON time if the closed 2 temperature setting (CL1+ CL2) conditions are met

LF2 : Closed 2 action OFF time setting
- Output OFF time when the closed 2 action ON (Ln2) time elapses
- e.g) Pn1 : 10Sec, PF1 : 5Sec, Pn2 : 15Sec, PF2 : 15Sec (same for the closed action)

(Open 2 action)	Action 2 ON (15 Sec)		Action 2 OFF (15초)	
(Open 1 action)	Action 1 ON	Action 1 OFF	Action 1 ON	Action 1 OFF
	(10Sec)	(5Sec)	(10Sec)	(5Sec)

※ If the current temperature is greater than the 1−step set temperature or the 2−step set temperature, the 2−step control will be given a higher priority.

CYC : Open/closed action maximum time setting
- The maximum time is set to prevent the open/closed action from being infinitely repeated and accordingly limit the open/closed action based on the set time (up to 250 minutes). If set at '0', the open/closed action will be infinitely repeated

UnIt : Change of the temperature unit
- C (temperature displayed in Celsius)
- F (temperature displayed in Fahrenheit)
※ Note: If you change the unit while the product is running, all the settings except for the unit will be initialized to factory settings. Please reset all the settings.

tYP : 1−step / 2−step control option
- If set at 1: 1−step setting and control only.
- If set at 2: 1−step/2−step setting and 1−step/2−step control
※ If the current temperature is greater than the 1−step set temperature or the 2−step set temperature, the 2−step control will be given a higher priority.
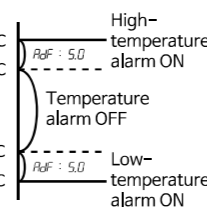
dIF : Deviation temperature setting
- For on/off control, there should be a certain interval between on and off.
- A relay or other output contacts may be quickly damaged or experience hunting (electricity generation, chattering, etc.) due to an external noise if the on/off function is used too frequently.
- Different temperature is set to prevent such phenomenon and protect relevant contacts.
- e.g.) See the oP1/CL1 actions (left).

Cor : Correction of the current temperature
- Used to correct the current temperature based on the reference temperature (e.g. mercury thermometer, existing thermometer, thermostat, etc.) when there is an input error by an external sensor even though the product itself does not have any problem

e.g.) Actual temperature: 10.0℃
Display window: 12.0℃ → **Cor** Modification of 0.0 to −2.0
→ Displayed as 10.0 (current temperature modified)

onS : Output ON time unit option
- SEC : Seconds / mln :Minutes

oFS : Output OFF time unit option
- SEC : Seconds / mln :Minutes

Addr : Communications address setting
- An address from 1 to 99 should be specified for RS485 communications.

bPS : Baudrate setting
- 1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS

LoC : Locking of the setting
- Safety function intended to prevent anyone other than the main user from changing the settings
- If set at on : All the settings except for the set temperature will be locked.
- If set at oFF : All the settings will be unlocked

HPr : High-temperature alarm temperature setting (−55.0 ~ 99.9℃)

LPr : Low-temperature alarm temperature setting (−55.0 ~ 99.9℃)

AdF : Temperature alarm difference setting (0.1 ~ 25.0℃)
e.g.) HPr:70.0, LPr:−40.0, AdF:5.0

70.0℃ ── High-temperature alarm ON
65.0℃ ─ ─ AdF : 5.0 ┐ Temperature alarm OFF
−35.0℃ ─ ─ Temperature alarm OFF
AdF : 5.0 ─ Low-temperature alarm ON
−40.0℃ ──

7 Setting range and factory settings

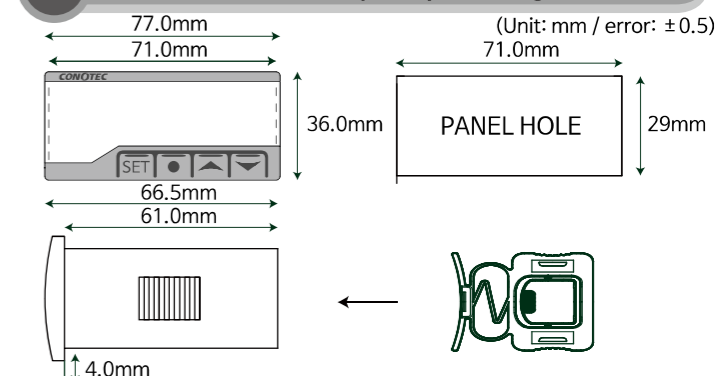| Display	Function	Applicable range in Celsius	Applicable range in Fahrenheit	Factory setting	Remarks
oP1	Open 1 temperature setting	−55.0 ~ 99.9	−60 ~ 200	20.0	
CL1	Closed 1 temperature setting	−55.0 ~ 99.9	−60 ~ 200	10.0	
oP2	Open 2 deviation temperature setting	0.1 ~ 25.0	1 ~ 250	10.0	
CL2	Closed 2 deviation temperature setting	0.1 ~ 25.0	1 ~ 250	10.0	
Pn1	Open 1 ON time setting	1 ~ 999		10	
PF1	Open 1 OFF time setting	1 ~ 999		1	
Ln1	Closed 1 ON time setting	1 ~ 999		10	
LF1	Closed 1OFF time setting	1 ~ 999		1	
Pn2	Open 2 ON time setting	1 ~ 999		10	
PF2	Open 2 OFF time setting	1 ~ 250		1	
Ln2	Closed 2 ON time setting	1 ~ 999		10	
LF2	Closed 2 OFF time setting	1 ~ 250		1	
CYC	Open/closed action maximum time setting	0 ~ 250		0	
UnIt	Temperature unit setting	C1F		C	C : Celsius F : Fahrenheit
tYP	1−step / 2−step control option	1 1 2		1	1 : 1−step 2 : 2−step
dIF	Deviation temperature setting	0.1 ~ 25.0	1 ~ 100	1.0	
Cor	Temperature correction setting	−10.0 ~ 10.0	−20 ~ 20	0.0	Correction of the difference between the displayed temperature & actual temperature
onS	ON time unit option	SEC 1 mln		SEC	SEC : Seconds mln : Minutes
oFS	OFF time unit option	SEC 1 mln		mln	SEC : Seconds mln : Minutes
Addr	Communications address setting	1 ~ 99		1	
bPS	Baud rate setting	1200 1 2400 1 4800 1 9600 1 192−		960	1200 :1200bps 2400 :2400bps 4800 :4800bps 9600 :9600bps 192− :19200bps
LoC	Lock setting	on 1 oFF		oFF	
HPr	High−temperature alarm temperature setting	−55.0 ~ 99.9	−60 ~ 200	99.9	
LPr	Low−temperature alarm temperature setting	−55.0 ~ 99.9	−60 ~ 200	−55.0	
AdF	Temperature alarm Deviation setting	0.0 ~ 25.0	0 ~ 100	1.0	

8 Communications specifications

Applicable standard	EIA RS485
Maximum units accessed	32 units (however, 1 ~ 99 available for address setting)
Communications method	2-line half-duplex; Asynchronous
Data speed	1200 / 2400 / 4800 / 9600 / 19200 bps (5 options)
Communications range	Within 1.2 km

Communications protocol	Modbus
Start bit, Stop bit	1 bit (fixed)
Parity bit, Data bit	Parity bit: None, Data bit: 8 bit (fixed)

※ Please see the user manual on our website for more details about the communications specifications.

9 Product dimensions and panel processing dimensions

(Unit: mm / error: ± 0.5)

77.0mm / 71.0mm
CONOTEC
SET ● ▲ ▼
36.0mm
66.5mm
61.0mm
4.0mm

71.0mm
PANEL HOLE
29mm

10 Easy error diagnosis instructions

※ If an error is displayed while the product is running
- **Er1** : It is a case where the product was subject to a strong external noise and internal data memories have been damaged. In this case, contact us for product service.
- Although this controller was designed to withstand a certain level of external noise, it is not supposed to withstand all levels of noise.,
- If the product is subject to a noise greater than 2KV, it could be internally damaged
- If o-E (open error) or S-E (short error) is displayed, there is something wrong with a sensor. Please check the sensor.
- A text such as HI.on (high-temperature alarm) or Lo.on (low-temperature alarm) refers to an alarm message for the temperature. Please check the sensor.
- If o-t (OK) is displayed, settings have been saved.
- A text such as LoCt (lock) indicates that the product is in the lock mode.
- IF GH3O (product name) is displayed, it refers to a model name.

※ The above specifications may be changed without any notice for performance enhancement. Please make yourself fully familiar with and follow the above precautions.

■ Address: (Street address) 56, Ballyongsandan 1-ro, Jangan-eup, Gijang-gun, Busan, ROK
(Land-lot address) 901−1, Ballyong-ri, Jangan-eup, Gijang-gun, Busan, ROK (46034)
- Product service : 070-7815-8266
- Customer service: 051-819-0425 ~ 0427
- FAX : 051-819-4562 • Website : www.conotec.co.kr
- Email : conotec@conotec.co.kr
- SNS : Facebook,Instagram,Twitter,YouTube ☞ 'Search for 'Conotec'

◆ Installation precautions
■ This device should be connected to a protective earth terminal and a power supply in order to prevent an electric shock.
■ Do not block the air outlet.
◆ Operation precautions
※ An operating environment of this device is as follows.
■ Ambient temperature: 0 ~ 60℃ ■ Ambient humidity: 80% RH or less
■ Indoor uses only ■ Pollution class: 2
■ Altitude under 2000m ■ Installation category: II
■ This device should be laid out in a way that its power cord is easy to handle
■ Using this product in any method other than those specified by the manufacturer may damage its protection function

■ Major products and development
- Temperature/humidity controller
- Counter and timer controller
- Current and voltage panel meter
- Temperature/humidity indicator
- Oven controller
- CO2 controller
- PID controller
- Unit cooler controller
- Heat pump controller
- Chiller controller
- Thermo-hygrostat controller
- Short message alarm
- Temperature/humidity transmitter
- Smartphone app and monitoring system

※ This manual was prepared in the Naver Nanum fonts.