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ADD ®

ISO 9001:2008
Registration of Design 0316273
CE

CONOTEC ® Digital Temperature Controller

CONOTEC CO., LTD.   www.conotec.co.kr

Operating Manual

FOX-2C1   FOX-2C2

1 Caution

※ **Safety and Hazard Instructions**

⚠ **Safety**

Pls use this item after installing the duplex safety device in which is applied at dangerous factors such as serious human injury or serious damages of property & important machine because this item is not designed as safety device

⚠ **Safety Instrruction and Hazard Warnings**

· Please read the operating manual throughly before putting the device into operation
· We will not assume any responsibility for damage to assets or persons caused by improper handling or failure to observe the safety instructions or hazard warnings
· For safety and licensing reasons, unauthorized conversion and/or modification of the device is not permitted.
· Do not exceed the maximum permissible current – in case of higher loads, use a contactor of adequate power. Make sure that the supplied voltage matches the values specified for the instrument.
· The device must be adequately protected from water and dust as per the application and must be accessible via the use of appropriate tools
· The device must not be exposed to extreme temperature, sunlight, strong vibrations or high levels of humidity.
· Operation or installation is not permitted under unfavorable ambient conditions such as wetness or excessive induction loads or solenoid and dust, combustible gases, vapors or solvents, especially high-frequency noise
· Avoid operation or installation close to high-frequency fields such as welding devices, sewing machines, wireless transmitter, radio systems, SCR controller, etc
· Do not install the sensor cable nearby signal cable, power cable, load cable.
· Please use the shield cable when the sensor cable's lengthen, however do not make it too much longer
· Please use the sensor cable without any cutting or flaw, blemish.

· The device is not a toy and should be kept away from children
· Installation work must only be carried out by suitably qualified personnel who are familiar with the hazards involved and with the relevant regulations.
· You shouldn't tinker with anything or the product may not be opened or disassembled unless you know what you're doing.
· Please ask us about this questioning

⚠ **Danger**
■Attention! Never work on electrical connections when the machine is switched on

2 Operation Manual

Model	Sensor	Temp.range	Size(mm)	Output	Function
2C1	K(CA)	−50℃~1200℃	77(W)x35(H)	100~240VAC 50/60Hz	Temp.
2C2	K(CA)	−50℃~1200℃	77(W)x35(H)		
2C1-D	K(CA)	−50℃~1200℃	77(W)x35(H)	AC:17~28V DC:12~35V	Temp.
2C2-D	K(CA)	−50℃~1200℃	77(W)x35(H)	AC:17~28V DC:12~35V	Temp.(1R) Alarm(2R)

3 Part name

1 Setting up
2 Setting down
3 Output1
4 Output2
5 Change function switch
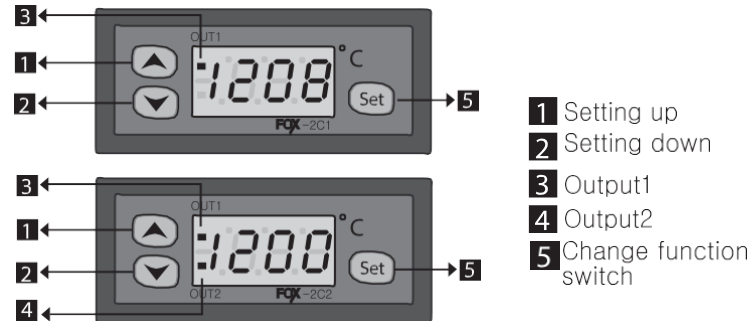
Setting temperature & programs
• setting temperature
The present temperature shall be displayed after turning on of the power supply.
If $\boxed{Set}$ key is pressed softly, SEt letter will be showed and then, if $\boxed{Set}$ key is pressed again, setting temperature will be flicked.
Press ▲ ▼ key to change the set values
If $\boxed{Set}$ key is pressed again, $o-t$ letter shall be showed and the setting temperature value shall be saved and the present temperature shall be displayed.
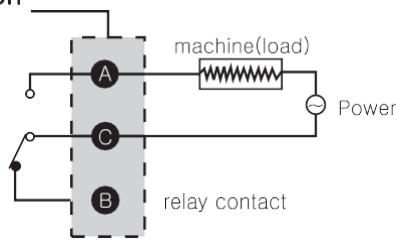• Setting programs
If $\boxed{Set}$ key is pressed for more than 5seconds, the program mode will be proceeded as following sequences
HSP->LSP->TYP->DLT->DIF->COR->,,,
The setting value of each mode should changed by pressing ▲ ▼ key and then press $\boxed{Set}$ key to move to next mode
※The set or programming mode is terminated, if you press the $\boxed{Set}$ key for more than 2 second, parameters(set values) are saved after showing $o-t$ letter or return to the present temperature automatically after 10seconds
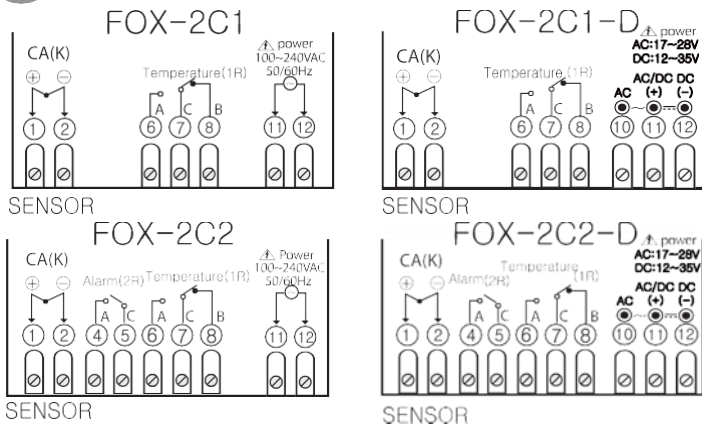
ADD ®

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■ Relay junction

machine(load)
Power
relay contact

※Relay contact capacity – less than 250VAC 2A

4 Connection

FOX-2C1

CA(K)
Temperature(1R)
⚠ power
100~240VAC
50/60Hz
SENSOR

FOX-2C1-D

CA(K)
Temperature (1R)
⚠ power
AC:17~28V
DC:12~35V
AC/DC DC
AC (+) (−)
SENSOR

FOX-2C2

CA(K)
Alarm(2R) Temperature(1R)
⚠ Power
100~240VAC
50/60Hz
SENSOR

FOX-2C2-D

CA(K)
Temperature(1R)
⚠ power
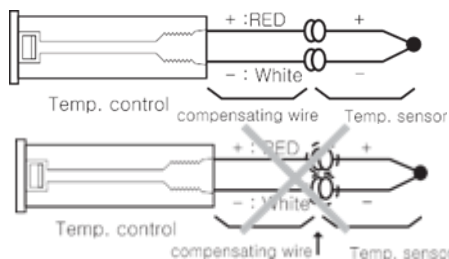AC:17~28V
DC:12~35V
AC/DC DC
AC (+) (−)
SENSOR

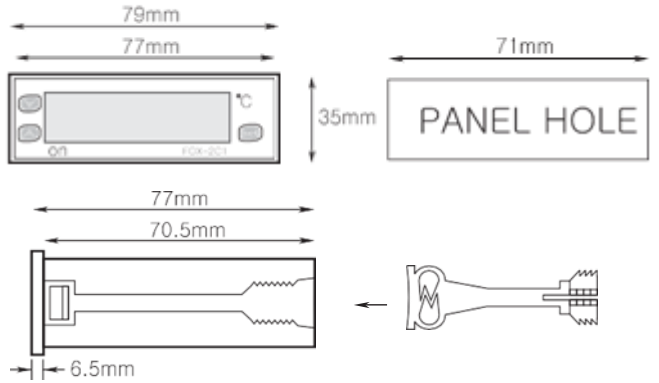## 5 Terminology

• cold junction compensating circuit

If the thermocouple sensor would be connected to the input
terminal of the controller, it might be some errors by bring
thermally generated emf in proportion to the ambient temperature
in the the contact point between the input terminal's metal and
the thermocouple sensor wire. To prevent, it is embedded in
cold junction compensating circuit.
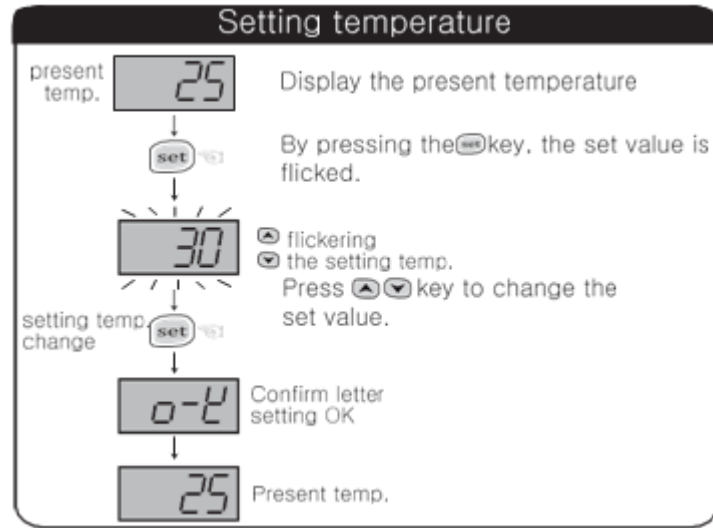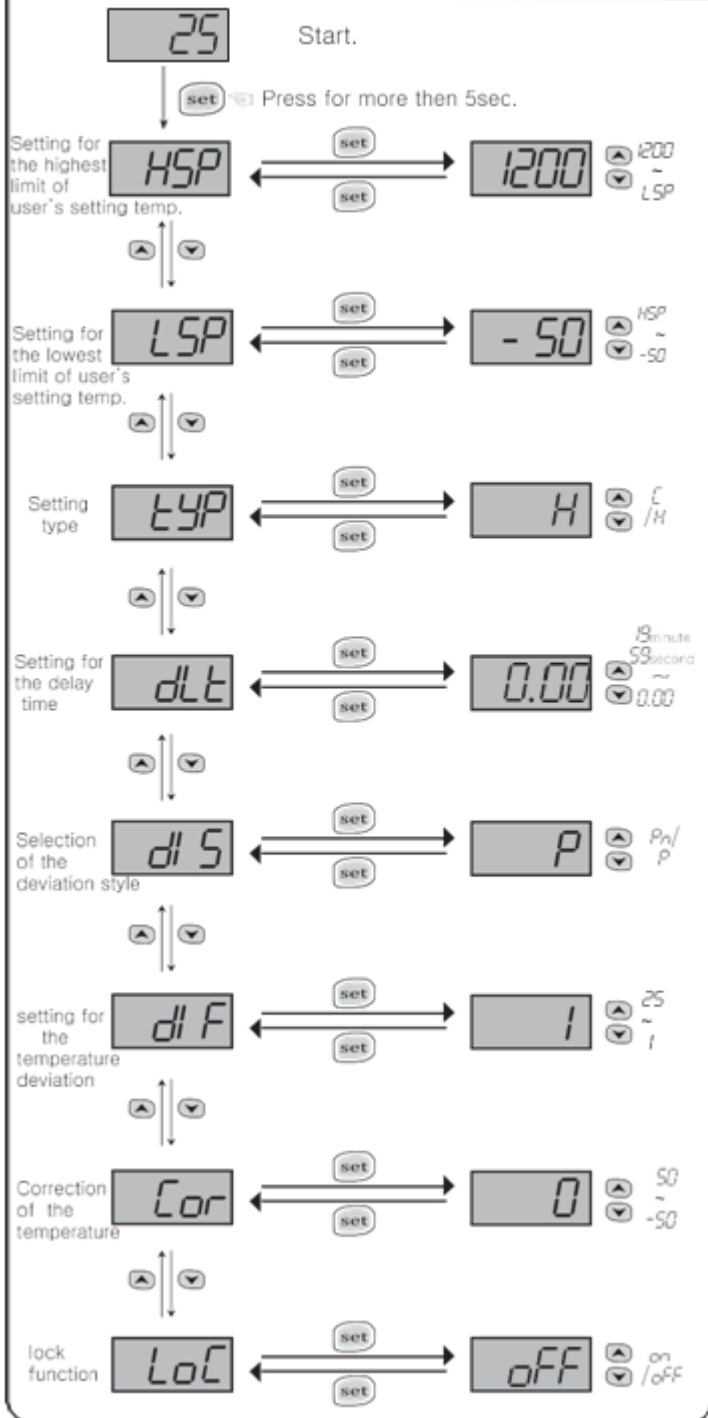
• compensating wire

- It is usually used at lengthening of the cable between
  thermocouple sensor and the controller
- If a general cable should be used, the contact point between
  thermocouple wire and general wire might be some errors by
  becoming another thermocouple sensor . To prevent it, it should
  be lengthen of the same wire as thermocouple's wire.
  The compensating wire usually consist of red wire for + polarity
  and blue(or white) one for − polarity
  When using of the compensating wire, pay attention in order
  not to be reversed for the polarity each other

+ :RED   +
− : White −
Temp. control   compensating wire   Temp. sensor

+ :RED   +
− : White −
Temp. control   compensating wire   Temp. sensor

6 Dimension

79mm
77mm
71mm
35mm
°C
on   FOX-2C1
PANEL HOLE

77mm
70.5mm
← 6.5mm

7 Sequence

Setting temperature

present temp. | 25 | Display the present temperature

By pressing the [set] key. the set value is flicked.

30 | ▲ flickering
▼ the setting temp.
Press ▲ ▼ key to change the set value.

setting temp. change

o-l | Confirm letter setting OK

25 | Present temp.

Setting for programs(2C1)

25 Start.

↓ (set) ☞ Press for more then 5sec.

Setting for the highest limit of user's setting temp. — **HSP** ⇄ (set)/(set) ⇄ **1200** ▲▼ 1200 ~ LSP

Setting for the lowest limit of user's setting temp. — **LSP** ⇄ (set)/(set) ⇄ **-50** ▲▼ HSP ~ -50

Setting type — **tYP** ⇄ (set)/(set) ⇄ **H** ▲▼ C /H

Setting for the delay time — **dLt** ⇄ (set)/(set) ⇄ **0.00** ▲▼ 19minute 59second ~ 0.00

Selection of the deviation style — **di S** ⇄ (set)/(set) ⇄ **P** ▲▼ Pn/ P

setting for the temperature deviation — **di F** ⇄ (set)/(set) ⇄ **1** ▲▼ 25 ~ 1

Correction of the temperature — **Cor** ⇄ (set)/(set) ⇄ **0** ▲▼ 50 ~ -50

lock function — **LoC** ⇄ (set)/(set) ⇄ **oFF** ▲▼ on /oFF

Setting for programs(2C2)

25 Start.

↓ (set) ☞ Press for more then 5sec.

Setting for the highest limit of user's setting temp. — **HSP** ⇄ (set)/(set) ⇄ **1200** ▲▼ 1200 ~ LSP

Setting for the lowest limit of user's setting temp. — **LSP** ⇄ (set)/(set) ⇄ **-50** ▲▼ HSP ~ -50

Setting type — **tYP** ⇄ (set)/(set) ⇄ **H** ▲▼ C /H

Setting for the delay time — **dLt** ⇄ (set)/(set) ⇄ **0.00** ▲▼ 19minute 59second ~ 0.0

Selection of the deviation style — **di S** ⇄ (set)/(set) ⇄ **P** ▲▼ Pn/ P change

setting for the temperature deviation — **di F** ⇄ (set)/(set) ⇄ **1** ▲▼ 50 ~ 1

Correction of the temperature — **Cor** ⇄ (set)/(set) ⇄ **0** ▲▼ 50 ~ -50

selection of the alarm output — **ALr** ⇄ (set)/(set) ⇄ **oFF** ▲▼ on / oFF

Selection of the alarm output type — **AtY** ⇄ (set)/(set) ⇄ **L** ▲▼ HL/ H/ L

OFF deviation of out2 alarm output — **AdF** ⇄ (set)/(set) ⇄ **1** ▲▼ 50 ~ 1

alarm output of the highest limit — **HPr** ⇄ (set)/(set) ⇄ **1200** ▲▼ 1200 ~ -50

alarm output of the lowest limit — **LPr** ⇄ (set)/(set) ⇄ **-50** ▲▼ 1200 ~ -50

lock function — **LoC** ⇄ (set)/(set) ⇄ **oFF** ▲▼ on/ oFF

8 Detailed manual

HSP : Setting function of the highest limit of temperature range
(Maximum set point allowed to the end user)
−Impossible to set up the set value more than HSP set value
ex) HSP = 25°C setting ⟶ impossible to raise the set value
more than 25°C

LSP : Setting function of the lowest limit of temperature range
(Minimum set point allowed to the end user)
−Impossible to set up the set value less than LSP set value
ex) LSP = 10°C setting ⟶ impossible to lower the set value
less than 10°C

tYP : Selection of the Cooling(CoL) & Heating(HEt)

dLt : Delay time of the output
It is widely used as the followings
−in case of operation machinery when re−input of the
power supply or momentary stoppage of power supply
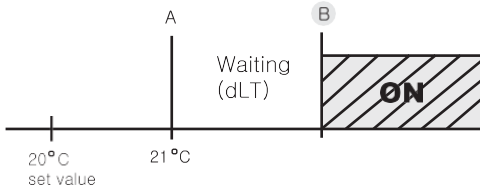
ex) If the set value is 1 :
from Ⓐ until Ⓑ time⟶the relay is ON in the Ⓑ point
after as delay as the dLt setting time(1min.)
(flickering the output lamp during the dLt time

diS : Selection of deviation style
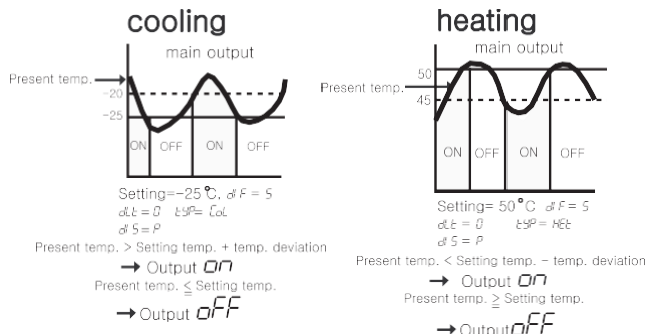
P Output : +deviation (be off at setting point)
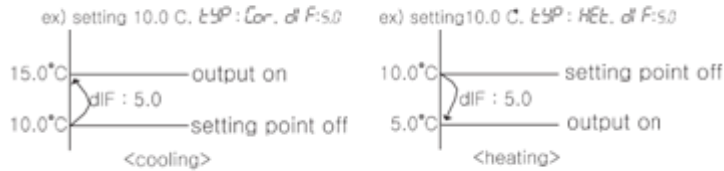
Pn Output : +deviation(based on the setting point)
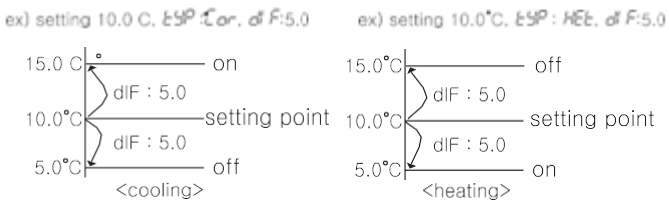
diF : Setting for temperature deviation
− In the ON/OFF control, it need at regular interval between ON
and OFF
− By operating the ON/OFF control frequently, the relay or its
output contact can be damaged quickly and it also occurs the
hunting(oscillating, chattering) by virtue of external noise,
You can make use of the temperature deviation in order to
protect its relay or contact and so on
ex) The method of the temp.deviation when ON/OFF control

cooling

Setting=−25 °C , diF = 5
dLt = 0 tYP = CoL
diS = P
Present temp. > Setting temp. + temp. deviation
⟶ Output ON
Present temp. ≤ Setting temp.
⟶ Output oFF

heating

Setting= 50 °C diF = 5
dLt = 0 tYP = HEt
diS = P
Present temp. < Setting temp. − temp. deviation
⟶ Output ON
Present temp. ≥ Setting temp.
⟶ Output oFF

Cor : Correction of the present temperature.
It is used for the correction of an discrepancy between the
display temperature and an actual temperature.

ex) actual temp : 10°C ⟶ Cor : 0.0 →(Change) −2 correction⟶ 10°C display
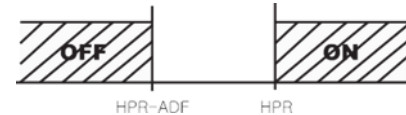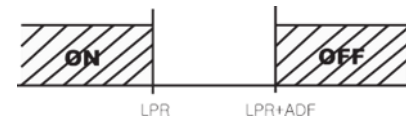display : 12°C

ALr : on: alarm on
oFF : alarm off

AtY :selection of the alarm

HL : alarm of the hightest & lowest limit
Output on − more than HPR setting value or less
than LPR setting value

LPR /HPR−ADF   HPR /LPR+ADF
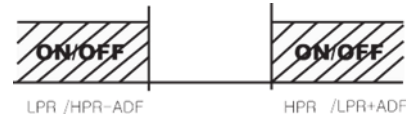
H : alarm of the highest
Output on − more than HPR setting value

HPR−ADF   HPR

L : alarm of the lowest limit
Output on less than LPR setting value

LPR   LPR+ADF

AdF :OFF deviation of Out2 alarm output

HPr : setting for highest alarm

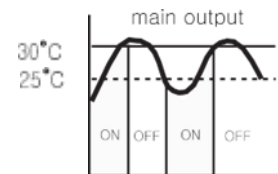LPr : setting for lowest alarm

LoC : on:lock function on
oFF : lock function off

■ex) application
ex)Heater⟶ turn off at 30°C ,turn on at 25°C
How to operate(setting for the temperature&programs)?

<Setting temp.> (see the setting temperarure)
setting : 30°C
<Setting program> (see the setting for program)
tYP : HEt
diS : P(deviation⟶ one side, set point ⟶off)
diF : 5 (on/off interval⟶5)
ex)Cooler ⟶ turn off at 0°C ,turn on at 2°C
How to operate(setting for the temperature&programs)?
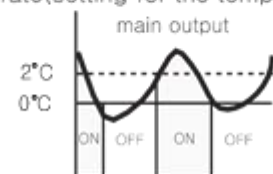
<Setting temp.> (see the setting temperarure)
setting : 0°C
<Setting program> (see the setting for program)
tYP : CoL
dIS : P(deviation⟶one side. set point ⟶off)
dIF : 2 (on/off interval ⟶2)

9 Temp.range&set value when deliver

Function	set value when deliver	Function	set value when deliver
HSP	1200	ALr	oFF
LSP	-50	AtY	L
tYP	H	AdF	1
dLt	0.00	HPr	1200
dIS	P	LPr	-50
dIF	1	LoC	oFF
Cor	0		

10 Error message

$Er1$ Memory error. Turn the power off and turn it on again
If the error message persists. please request us A/S by return

$o-E$ Sensor error. The sensor is interrupted.Check the cable.

$S-E$ Sensor error. The sensor is short−circuited. Check the cable