



Operating Manual



<FOX-2001CC>

1 Caution

Danger

- Attention!
Never work on electrical connections when the machine is switched on.

Safety Instruction and Hazard Warnings

- Please read the operating manual carefully 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 lengthened, 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..

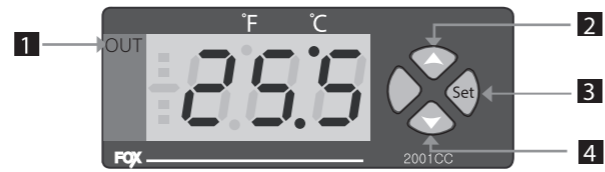
Safety

Please 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 a safety device.

2 Composition

Model	Sensor	Output	Temp. range	Function
FOX-2001CC	NTC	Relay	Celsius : -55.0°C ~ 99.0°C Fahrenheit : -67°F ~ 212°F	temp. control(°C, °F) 485 communication
FOX-2001CC-S	NTC	SSR		

3 Part name

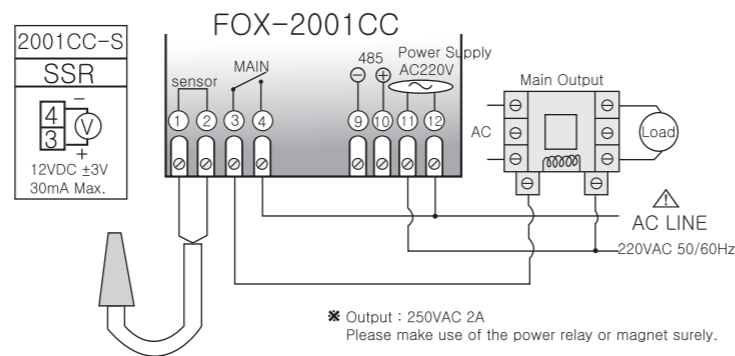


- 1 Output lamp
- 2 Setting up
- 3 Change function switch
- 4 Setting down

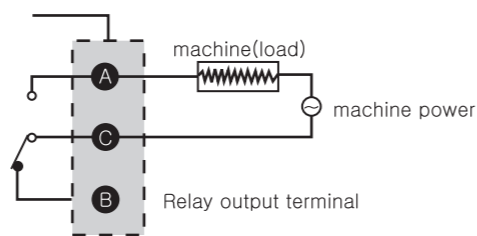
The function of each key

- : A key to change of the programs & setting temperature
- : A key to change of the program's set values & temperature.

4 Connection

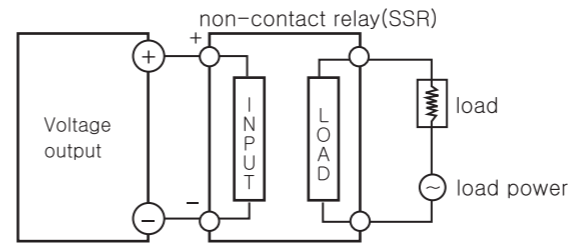


Relay junction



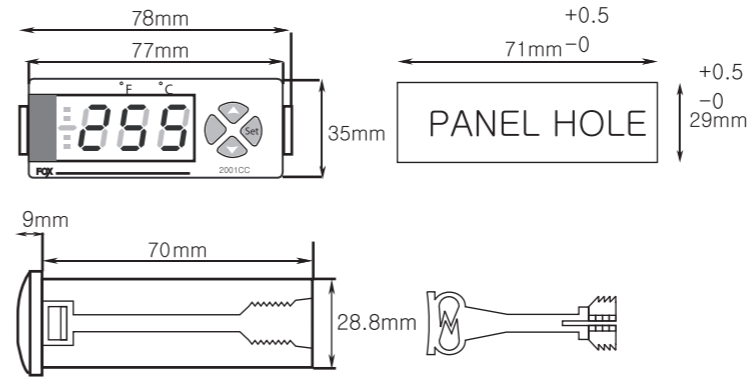
* Relay access capacity is less than 250VAC 2A.

SSR junction



* Please make sure that the SSR's capacity should be used more than load capacity.

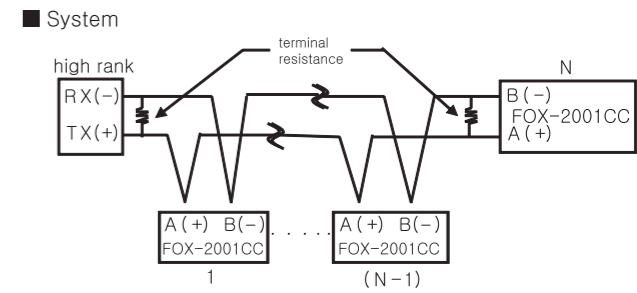
5 Size & Dimension



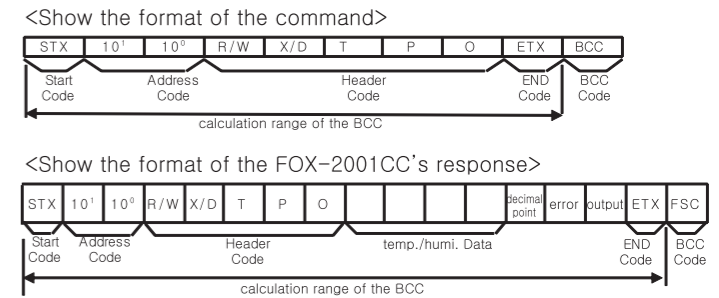
6 Temp. range & Set value when deliver

Display	Function	Celsius range	Fahrenheit range	Set value when deliver	Remarks
	Setting Temp.	-55.0 ~ 99.9	-67 ~ 212	10.0	
unt	Unit of Temp.	°C / °F		°C	°C : Celsius °F : Fahrenheit
HSP	setting for the highest limit of user	lsp ~ 99.9	lsp ~ 212	99.9	It is irrelevant to the relay output
lsp	setting for the lowest limit of user	-55.0 ~ hsp	-67 ~ hsp	-55.0	It is irrelevant to the relay output
typ	Selection of the function	col / het		col	het : heating col : cooling
dis	Selection of the deviation style	p / pn		p	pn : deviation± p : deviation+
dif	Temperature deviation	0.1 ~ 19.9	1 ~ 35	1.0	
dlt	Delay time	0.00 ~ 9.59		0.00	(min.sec)
cor	Correction of Temp.	-10.0 ~ 10.0	-18 ~ 18	0.0	correct for a discrepancy between the display temp. and real temp.
adr	Communication channel	01 ~ 99		0.1	
bps	Communication speed	120/ 240/ 480/ 960/ 19-		120	120 : 1200bps 240 : 2400bps 480 : 4800bps 960 : 9600bps 19- : 19200bps
loc	Lock function	on/off		off	on : setting for the lock function off : removal of the lock function (however, except for the setting temperature value)

7 Communication

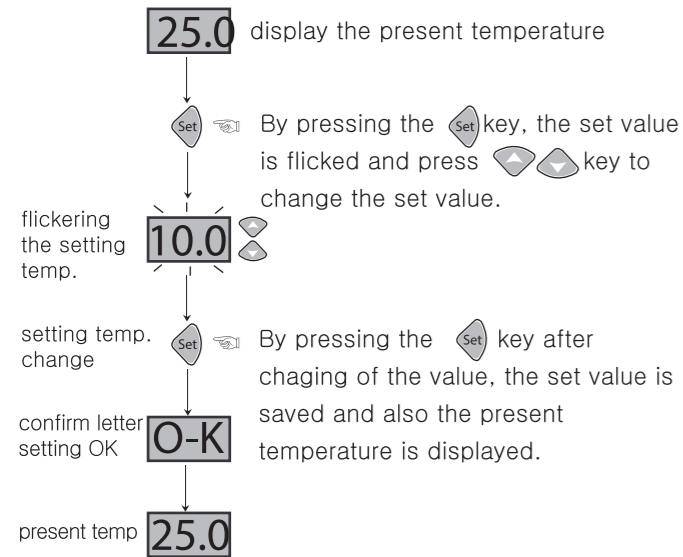


Definition between communication

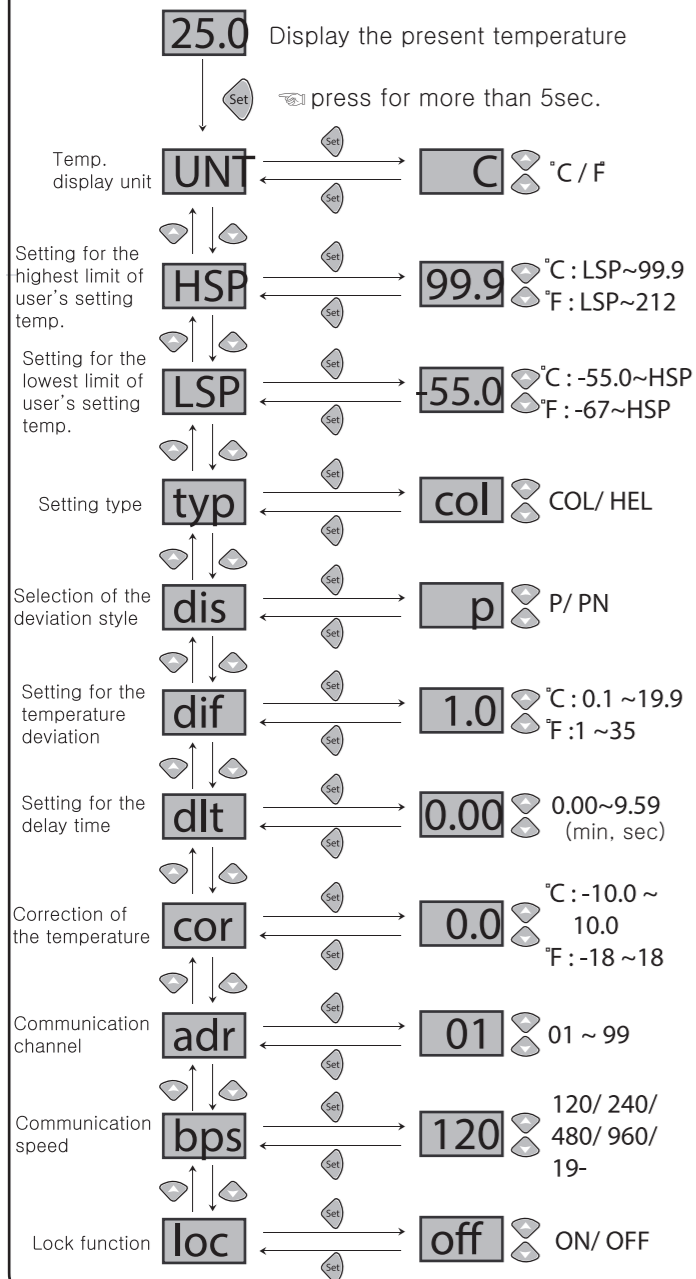


- Start Code**
- show the lead(head) of the block
ACK will be added in case of STX → [02H], response
- ADDRESS CODE**
- A high rank system can discriminates the channel code number among FOX-2001CC
It is available to set between 01 and 99(BCD ASCII)
- Header Code**
- Show the command name as a alphabetic letter
RX(reading demand) → R[52H], X[58H]
RD(reading response) → R[52H], D[44H]
WX(writing demand) → W[57H], X[58H]
WD(writing response) → W[57H], D[44H]
TPO(temperature measuring value) → W[54H], P[50], O[30H]
- Composition of data**
- Data is displayed as "Hexadecimal"
- Decimal point** → 0[30H] there is no "decimal point"
1[31H] there is "decimal point"
- Error** → 0[30H] there is no "error"
1[31H] interrupted of the sensor's cable
2[32H] short-circuited error of the sensor
- Output** → 0[30H] OUT OFF
1[31H] OUT ON
- END Code**
- Shoe the end (close) of the Block ETX → [03H]
- BCC(Block Check Character)**
- Show the XOR arithmetic and logic values from the start(STX) to the ETX
* The others : AS of not response of the ACK
① In case of not equivalent to the channel after receiving STX
② In case of generating the receive buffer overflow
③ In case of not equivalent to the communication's set values or baud rate
* Treatment - in case of no response of the ACK
① Check the cable
② Check the communication's condition (set values)
③ If the main cause of the status is the noise, try to do communication practicing 3-times until recovering nomally.
④ Change the communication speed in case of bring about the communication's error frequently.

Setting temperature



Setting for programs



UNT: Change of the display unit

°C : Celsius
°F : Fahrenheit

Caution : If you change the display unit under operating this controller, please reset all of set values because all of setting values except **ADR**, **BPS** should be changed the setting value when delivert.

Celsius : **hsp**:99.9 **isp**:-55.0 **typ**:C **dis**:P **dif**:1.0
DLT:0.00 **COR**:0.0 **ADR**:01 **BPS**:120 **LOC**:OFF
Fahrenheit : **HSP**:212 **LSP**:-67 **typ**:C **dis**:P **dif**:1
DLT:0 **COR**:0 **LOC**:OFF

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 = 25.0°C setting ⇒ impossible to raise the set value more than 25.0°C

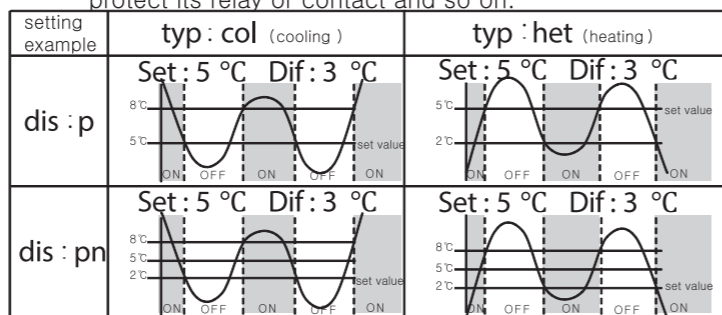
isp : Setting function of the lowest limit of temperature range (Minimum set point allowed to the end user)
- Impossible to set up the set value less than HSP set value
ex) HSP = 10.0°C setting ⇒ impossible to lower the set value less than 10.0°C

typ : Selection of Main output function
COL : Cooling
HET : Heating

dis : Selection of deviation style
p Output : +deviation (be off at setting point)
ex) setting 10.0°C, **typ**:Col, **dif**:5.0
15.0°C — output on
10.0°C — setting point off
5.0°C — setting point off
<cooling>

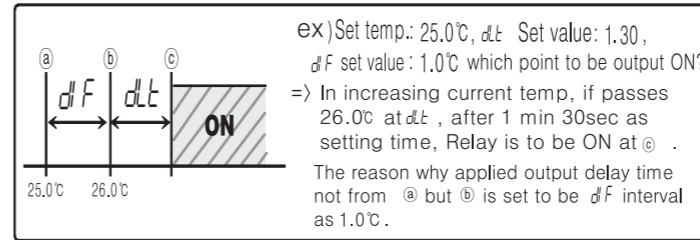
pn Output : ±deviation(based on the setting point)
ex) setting 10.0°C, **typ**:COL, **dif**:5.0
15.0°C — on
10.0°C — setting point
5.0°C — off
<cooling>

dif : Setting for temperature deviation
- In the ON/OFF control it needs 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 (oscillation, 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.



dlt : Delay time of the output

It is widely used as the followings
- in case of operating the ON/OFF control very often
- to protect the operation machinery when re-input of the power supply or momentary stoppage of power supply



aDR Communication channel
- To designate the channel while RS485 communication.

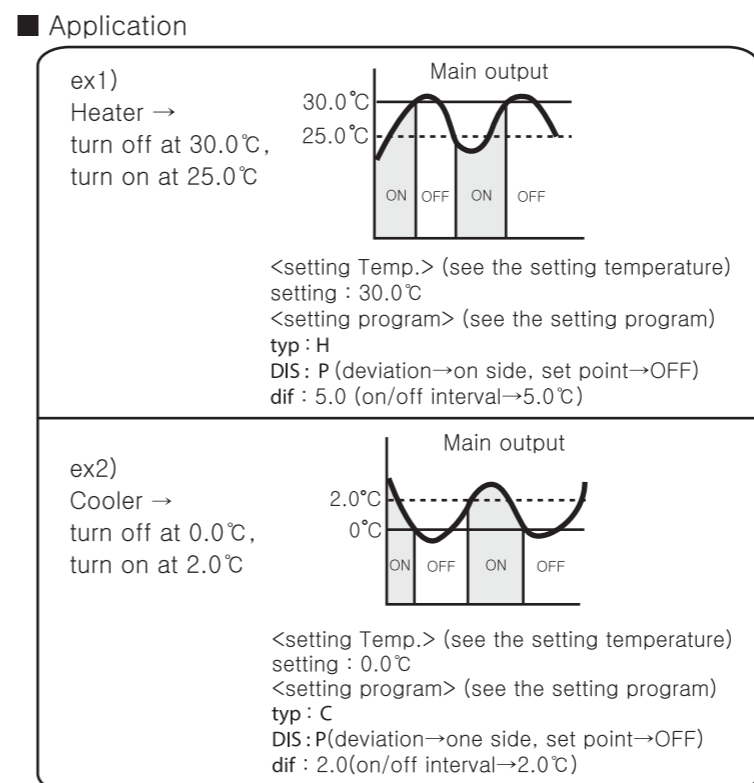
COR Correction of the present temperature
It is widely used as followings ;
- In case of operating the ON/OFF control very often
- To protect the operation machinery when reinput of the power supply or momentary stoppage of power supply
ex) real temp. : 10.0°C **COR** : 0.0(-2.0 correction)
display : 12.0°C 10.0°C display

BPS : Communication speed
1200BPS / 2400BPS / 4800BPS / 9600BPS / 19200BPS

LoC : The lock function
- As a safety device, it is used in order not to change the set values except for the main user.
ON - setting for the lock function
OFF - removal for the lock function

Model & Output spec

	2001CC	2002CC	2003CC	2001TX	2000TX	2003TX	2000RX
temp. output	○	○	○	○	○	○	-
alarm output	-	○	-	-	○	-	-
defrost output	-	-	○	-	-	○	-
FAN output	-	-	○	-	-	○	-
communication	○	○	○	○	○	○	○



- **Erl** : Memory error. Turn the power off and turn it on again. If the error message continued, please contact our A/S for safety.
- **o-E** : Sensor error. The sensor is interrupted. Check the cable.
- **S-E** : Sensor error. The sensor is short-circuited. Check the cable.

* This device's specification can be changed without any notification to improve its quality

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■ Main Products & Development
- Digital Temperature /Humidity Controller
- Digital Timer, Current/Voltage Meter
- Other Products Development

MEMO