



CONOTEC CO., LTD.

Digital Temperature Controller

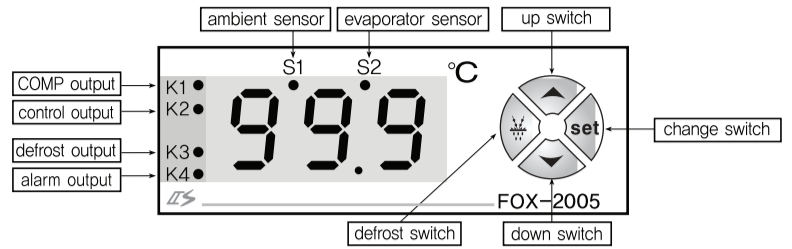
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FOX-2005

MODEL	SENSOR	RANGE	SIZE
FOX-2005	NTC(10K)	-55.0°C ~ 99.9°C	77mm × 35mm

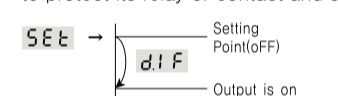
Part Name



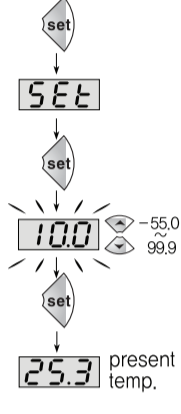
The function of each key

- set**: A key for change of the setting value.
Press the **set** key for more than 2second to record the configured value and if you do not press any key, return at present temperature or be recorded the configured value automatically after 10seconds.
- ☺**: A key for manual defrost.
If the **☺** key is pushed over 4 second continually, manual defrost function is operated or be removed. (details : Please refer to number 35)
- ◀**: A key for change of the setting value or conversion into the S2(evaporator sensor)temperature display.
After indicating the S2 temperature, return at S1 temperature display automatically after 5seconds.
- ▶**: A key for change of the setting value. It indicates the controller's present process (**drE**, **dEL**, **FAn**, **PrE**, **dEF**). Return at present temperature display after 5second.

Detailed explanation

- LoC**: Lock function for setting value : As a safety device, it is usually used as following case : in order not to change the set value except for an main user.
Lon - Setting for Lock function
LoF - Removal for Lock function
- dIF** (hysteresis): Setting for temperature deviation : In the ON/OFF control, it need at regular intervals between ON and OFF. If the ON/OFF operation is activated frequently, the relay or output contact can be damaging quickly and it occurs the hunting(oscillating, chattering)by virtue of external noise, and so on. To prevent these happenings, you can setting up the temperature deviation in order to protect its relay or contact and so on.

- CS1**: Temperature correction for S1(ambient sensor)
- CS2**: Temperature correction for S2(evaporator sensor)
Correction function for an discrepancy between display temperature and real temperature
ex)A real temperature is 23°C only, but the display temperature was 23.5°C → Please make use of **CS1 CS2** function and you can correct the display temperature by 0.5°C.
- LSP**: Setting for the upper limit of user's setting temperature.(Minimum setting point allowed to end user)
It's impossible for the **SET** value to set up less than the **LSP** value.
- HSP**: Setting for the lowest limit of user's setting temperature.(Maximum setting point allowed to end user)
It's impossible for the **SET** value to set up more than the **HSP** value.
- dty**: Defrost method
ELd : electrical defrost (defrost output is operated only)
HGd : hot gas defrost (defrost output & COMP outputs are operated)
- S.td**: Initial defrost condition (It defines if the initial of defrost will be operated wether temperature or time)
tId : Defrost start by the time
tEd : Defrost start by the evaporator's temperature
- d.oF**: Intervals between defrost : It determines the time's interval that the instrument do the defrost, As of the defrost by the evaporator temperature → the defrost only will start if the temperature in S2(evaporator sensor) is lower than **t.Sd** desired value.
- t.Sd**: Temperature for initial defrost : As of the defrost by the evaporator temperature →When evaporator temperature reaches the **t.Sd** desired value , the controller will start the defrost.
- t.Pd**: Maximum waiting time for pre-defrost temperature : After the power supply is turn on, it will do the first defrost. The defrost will start after **t.Pd** desired time. When it is reached at **t.Sd** desired temperature value, the defrost will start or return at cooling.
- d.dI**: Waiting time for pre-defrost time : When the **S.td** → **tId** , it is operated.
It is an extra time for remaining in cooling as much as **d.dI** desired value before do the first defrost.
And then, after passing of this time, the defrost is operated.
- d.Po**: System defrost : When the power supply is turned on the controller, it selects the defrost.
YES System defrost is operated, / **no** System defrost is not operated.
- t.Ed**: Temperature for defrost end : If the S2(evaporator temperature) is higher than the **t.Ed** desired value, the defrost is closed.
- d.on**: Maximum time for defrost : It determines the maximum time that controller will keep the defrost.
Disorder of the S2(evaporator sensor) or in case of, if the defrost by the temperature does not closed, the defrost is closed by the time.
- F.dr**: FAN selection when defrost : **F.on** → When defrost, FAN is operated
F.oF →When defrost, FAN is not operated
- I.Hd**: Selection for temperature display when defrost
YES : temperature display / **no** : locking for temperature display
This function prevents that the temperature rise in the ambient temperature due to visualized(exposed) defrost.
*Appropriate temperature : It means the last ambient temperature before the defrost will start. During defrost, the last measured temperature in cooling cycle will be frozen on the display. And if the next COMP is operated, the frozen will be removed.
- d.rE**: Draining time (water dripping after defrost) : Necessary time for dripping, to drain the last water drops from evaporator. All outputs keep turned off. If you need the COMP - on immediately after defrost, adjust this time for "0".

Setting temperature



Setting program

*To change the function which you want, after shifting the key which you want, by pressing **◀▶** key, and then, if **set** key is pushed, setting value is flicked. At this time, press **◀▶** key to change the setting value.(To change the data value, please progress the next mode surely after setting as follows : **LoC** change **Lon**)

Press over 5 second continually

LoC	↔	Lon	LoF
dIF	↔	10	0.1~25.0
CS1	↔	00	-10.0~10.0
CS2	↔	00	-10.0~10.0
LSP	↔	-55.0	-55.0~99.9
HSP	↔	99.9	-55.0~99.9
dty	↔	ELd	HGd ELd
S.td	↔	tEd	tId
d.oF	↔	006	1~250time
t.Sd	↔	-30.0	-55.0~74.9
t.Pd	↔	010	001~250min.
d.dI	↔	010	001~250min.
d.Po	↔	no	no YES
t.Ed	↔	75.0	-29.9~99.9
d.on	↔	020	001~250min.
F.dr	↔	F.oF	Fon FoF
I.Hd	↔	no	YES no
d.rE	↔	000	000~250min.
t.Fd	↔	00	-55.0~99.0
F.dE	↔	001	001~250min.
F.Co	↔	Con	Con ICo
F.St	↔	99.9	-55.0~99.9
F.dI	↔	20	0.1~25.0
L.Pr	↔	-55.0	-55.0~99.9
dIL	↔	10	0.1~25.0
H.Pr	↔	99.9	-55.0~99.9
dIH	↔	10	0.1~25.0
R.Pd	↔	000	000~250min.
R.td	↔	000	000~250min.
dSP	↔	000	000~250min.
t.on	↔	000	000~999sec.
t.oF	↔	000	000~999sec.
S.EJ	↔	SoF	SoF Son

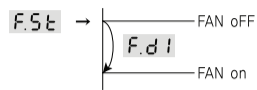
19. **t.Fd** : FAN start temperature after draining : This process is necessary to remove the heat that exists in the evaporator because of the defrost.

20. **F.dE** : Maximum time for FAN return after draining.
For security, the evaporator temperature does not reach the adjusted value in **t.Fd** or if the S2 sensor is detached, it will determine the maximum time for FAN return

21. **F.Co** : Selection for FAN operation
t.Co : The fan keeps turned on while compressor is turned on,
The fan keeps turned off while compressor is turned off.
Con : The fan keeps turned on during all cooling cycle

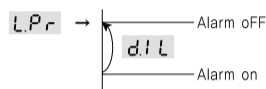
22. **F.St** : FAN stop temperature : The fan stop by high temperature in the evaporator

23. **F.dI** : Deviation for fan return after FAN stop (deviation for fan-delay)
If the fan is turned off because it is higher than desired value in evaporator's temperature, it will determine the temperature deviation for FAN-return



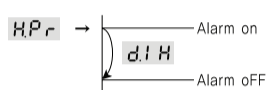
24. **L.Pr** : Alarm for the lowest limit : When the input temperature(S1) is lower than the lowest limit, the alarm will be operated.

25. **d.I.L** : Return deviation for alarm of the lowest limit.



26. **H.Pr** : Alarm for the upper limit : when the input temperature(S1) is higher than the upper limit, the alarm will be operated.

27. **d.I.H** : Return deviation for alarm of the upper limit.



28. **R.Pd** : Stop time for system alarm : Stop time of alarm output immediately when power supply is turned on. If the desired **R.Pd** time passes, alarm is operated normally.

29. **R.td** : Alarm stop time after draining : Stop time for alarm output after draining.
This function serves to inhibit the alarm during a period because of a rising in temperature during the proceeding of defrost

30. **d.SP** : Delay time for system starting : When the instrument is turned on, it(all output) is incapacitating. During this time, it is operates only as temperature indicator.

31. **t.on** : Minimum time of compressor turned on : It is the minimum time that the compressor will keep turned on, it means, space of time between the last drive and the next stopped.

32. **t.oF** : Minimum time of compressor turned off : It is the minimum time that the compressor will keep turned off, it means, space of time between the last drive and the next stopped. It serves to alleviate the discharge pressure and to increase the useful life of the compressor.

33. **S.EU** : When ambient sensor(S1) errors, selection for the compressor
S.oF : When ambient sensor(S1) is detached, the compressor keeps turned off.
S.on : When ambient sensor(S1) is detached, the compressor keeps turned on.

34. Change of indication when the alarm is turned on.

present temp. ⇒ **ALH** ⇒ present temp. **ALL** ⇒ ...

It is indicated repeatedly as above method. Notice) After alarm's operation, if **set** key is pushed, you can remove the alarm output temporarily. The alarm which is removed temporarily, after the alarm is turned off normally by temperature and then, if the alarm is operated again, the output is turned on.

ALH Alarm for the upper limit.

ALL Alarm for the lowest limit.

35. **set** : Manual defrost : To manually activate the defrost, press the **set** key for more than 4second until appears the indication **PrE**. And to close the manual defrost in an manual defrost condition, press the **set** key for more than 4 second until appears the indication **PrE**.

36. Process stage

drE ⇒ Initial delay (delay time to turn on the instrument)

dEL ⇒ Fan-delay (Fan-delay after defrost)

FAn ⇒ Refrigeration

rEF ⇒ Pre-defrost

PrE ⇒ Defrost

dEF ⇒ Draining

37. **Err** display

● **Er1** ⇒ It is the damage of memory data for various of inner-data due to be get noised strongly from outside while using this instrument.

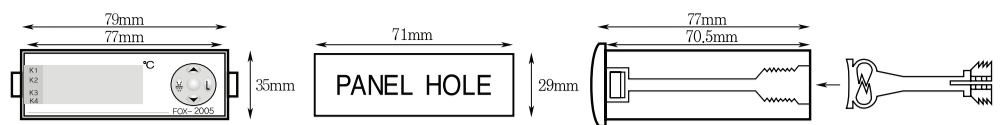
● **oE1** ⇒ Display of detached ambient sensor

● **oE2** ⇒ Display of detached evaporator sensor

● **SE1** ⇒ Display for an short-circuit of the ambient sensor

● **SE2** ⇒ Display for an short-circuit of the evaporator sensor

■ Connection



■ Temp. range & set value when deliver

display	range	set value when deliver
SEt	-55.0 ~ 99.9℃	10.0
L.oC	Lon / LoF	Lon
dIF	0.1 ~ 25.0	1.0
t.S1	-10.0 ~ 10.0	0.0
t.S2	-10.0 ~ 10.0	0.0
L.SP	-55.0 ~ 99.9	-55.0
H.SP	-55.0 ~ 99.9	99.9
d.tY	eLd / HGd	eLd
S.td	tId / tEd	tEd
d.oF	1 ~ 250time	6
t.Sd	-55.0 ~ 99.9	-30.0
t.Pd	1 ~ 250min	10
d.dI	1 ~ 250min	10
d.do	YES / no	no
t.Ed	-55.0 ~ 99.9	75.0
d.on	1 ~ 250min	20
F.dr	Fon / FoF	FoF
I.Hd	YES / no	no
d.rE	0 ~ 250min	0
t.Fd	-55.0 ~ 99.9	0.0
F.dE	1 ~ 250min	1min
F.Co	tCo / Con	Con
F.St	-55.0 ~ 99.9	99.9
F.dI	0.1 ~ 25.0	2.2
L.Pr	-55.0 ~ 99.9	55.0
d.I.L	0.1 ~ 25.0	1.0
H.Pr	-55.0 ~ 99.9	99.9
d.I.H	-55.0 ~ 99.9	1.0
R.Pd	0 ~ 250min	0
R.td	0 ~ 250min	0
d.SP	0 ~ 250min	0
t.on	0 ~ 999sec	0
t.oF	0 ~ 999sec	0
S.EU	Son / SoF	SoF

■ Caution

⚠ Warning

Pls use this item after set up safety device doubly in which is applied at dangerous equipment such as serious human injury or serious damages of property & important machine because this item is not designed as safety device.

⚠ caution

- Do not distributing wires or install the device for the occurrence of an induction load of motor, solenoid.
- Please use shield wire when sensor lengthen, however, do not make it too much longer.
- Please do not use the components which is occurring arks when on/off near it or same power.
- Power cable keeps away from high-voltage cable and do not install the device where water, on and dust.
- Do not install the device from direct rays of the sun & exposed a site due to rain.
- Do not install the device from strong magnet & noise, vibration or shock.
- Please install the device from a great distance out of places occurring strong-alkali or strong-acidity.
- Do not sprinkle water for clean purpose when installing in the kitchen.
- Do not install the device from the places where Temp./Hum. exceed regular power.
- Please use the sensor wire without any cutting & flawing.
- Do not install the sensor wire nearby signal wire, power or load and please use self-pipe.
- Please understand you can't get any A/S service when you open or re-model it with free.
- is the safety letter like warning, caution.
- Please do not use the device close by which occurring strong high-frequency noise (high-frequency;welding, sewing machine, wireless transmitter, SCR controller for high capacity)
- Please use this item proper method without any damage or injury.

⚠ Danger

- Caution, Danger of electric shock
- Electric shock - Do not touch AC board during on power because of electric shock.
- Please intercept input power surely when input power check.

The way of diagnosis for breakdown

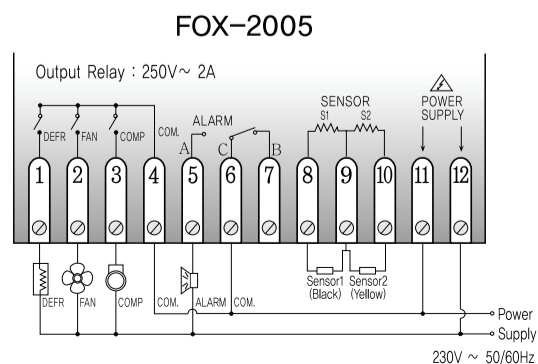
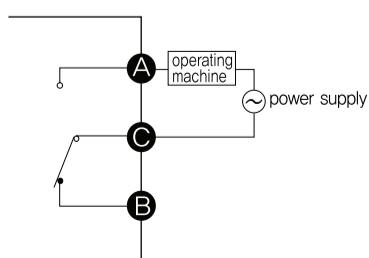
■ Indicating ERROR on using items

- This **Er1** is the damage of memory data for various of inner-Data due to be get noised strongly from outside while using this items. Please request us A/S by return. Although our controller is designed as the complementary measures regarding these noise from outside, it is not endurable against these noise with endlessly.
- If noise (2kv) disordering become an inflow, the inner-part will be damaged.
- When shows these letter **oEr** (open error), **SEr** (short error) error in sensor. Pls check sensor.

*Above Products information can be changed to improve it's quality without any notification When this products use, pls observe the information of caution & Warning due to give rise to disordering.

■ ex) relay output junction

■ Connection



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