1. Before you use this, please make sure that you make use of this after you are fully well-informed of the precautions of safety at all cost.
2. If you have any details to confirm during the time to use it, please make a call for the care line for any advice.

⚠ Warning

1. Since this temperature regulator was not produced as a safety device, you must be surely equipped with double safety apparatus if you use it for devices that might cause expected death accidents or property loss.

Danger

1. When applying an electric current, you must not contact with any support insulator at all times.
2. When you check up the input/output or support insulator, you must shut off an input power source. As instantaneous electric shocks can lead to losses of life, make sure to keep its Observance.

⚠ Cautions

1. Make sure to avoid sharply sudden increases of temperature as well as humidity, and excessive shocks.
2. Please make an installation of it without the spot of strong acidity, alkalinity, oil, dust and other direct rays of the sun.
3. It is recommended to use the device of which the temperatures be kept between 0~60℃ compared to surroundings and humidity be within 60%.
4. Please make an installation job after you keep substantial distances from high frequency devices(motor or SCR etc.), High voltage devices, and an engine or generator.
5. The electric wiring of this regulator should be separated from the supporting positions respectively in order to prevent its error done by inductive noise from coming into motion.
6. For a sensor extension, other independent pipe must be used to separate it from input or output source, electric power and supporting lines and you must also be cautioned not to expose the connecting part in the middle.
7. Since relay device installed inside the regulator is used for the signal only, not for the load, you must not use it for the load(Allowable Heater only 100watt/250vac).
8. In case you don't use it for a long time, lightning or thunderbolt to be shock, please make sure whether an input power is kept to shut off.
9. Our company do not take any responsibilities for any damages caused by not observing the following warning or cautions and making mistake to be charged for consumers.

◆. **Warranty** : This product is warranted against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, product determined by us to be defective in form or function will be repaired or, at our option, replaced at no charge. This warranty does not apply if the product has been damaged by accident, abuse, and misuse or as a result of service or modification other than the company. This warranty is in lieu of any other warranty expressed or implied.

1. If this regulator becomes out of order due to excessive shock or sharp temperature rises.
2. If a certain product was disassembled or remodelled for other perposes.
3. If it is out of order due to the fire or other natural catastrophe.

Wooree Electronics Co., Ltd.

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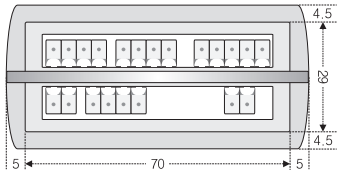
ISO CE INNOBIZ

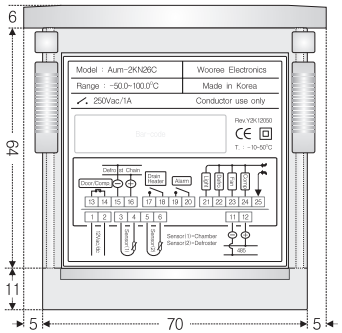
Front view

Behind view

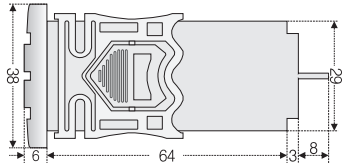


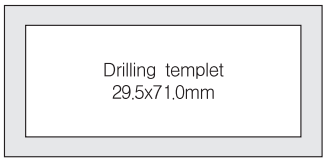
Unit : mm
Scale :1/2

Top view

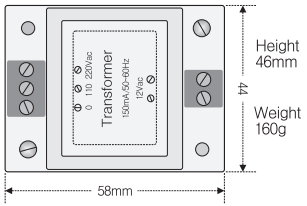


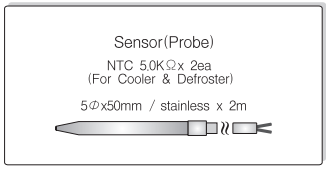
Side view





Top View(Transformer)





◆. Model Aum-2KN26C : **For Cooling only**

1. For exclusive use of Cooling Comp., Fan, Defroster, Light, Alarm, Drain Heater, defrost interlock, Door/Comp. fault, Communication and night Set-back functions can be selected.
2. When defrost is operated interlock, Please wire terminal numbers 15 and 16 to the same number terminals. Wired controllers are operated with defrost start and initial cooling times simultaneously interlocked.
3. When monitoring function of Door open/Comp. fault is not required, both sides of terminal numbers 13 and 14 must be connected(short).
4. For 485 communication, please wire terminal 11 and 12 to the same number terminals for each controller.

Nos	Status	Range	Functional Description	Apply	Initial value
1.	Selection V.	-50.0 ~ 100.0°C.	Estimated keeping temperature S.V	Chamber	
2.	Differential V.	00 ~ ±12.7°C	S.V ± Dif.=Hysterisis. Dif	S.V.	
3.	Calibration	-6.3 ~ 6.3°C	Temperature calibration. Ca	Present. temp.	
4.	Time Delay	Pr00 ~ Pr15min.	Time Delay(Pr=Protect), Cooler	Cooling delay	
5.	Alarm High	-50.0 ~ 100.0°C	Alarm Highest temp. limit	Alarm High	
6.	Alarm Low.	-50.0 ~ 100.0°C	Alarm Lowest temp. limit.	Alarm Low	
7.	Alarm delay.	ALOF/A000~A254min.	A000~A254min./ALOF=ALarm OFF	Alarm	
8.	Alarm mode	AL-C / AL-F	AL-Continuoes, AL-Flick	Alarm	
9.	Alarm buzzer	b on / boFF	Alarm buzzer ON/OFF(b=buzzer)	Alarm	
10.	Defrost way	HEAt / Hot.	HEAt=Electric heater / Hot gas	Defrost	
11.	Defrost. Interval	Int. / rtc	"Int"=Interval/ "rtc"=Real time control.	Defrost step	
12.	Defrost. temp.	E00.0 ~ E37.7°C	Estimated defrost End temp.(E=End)	Defrost stop	
13.	Defrost time.	Ft01 ~ Ft63min.	Estimated defrost Finish time(Ft)	Defrost stop	
14.	Drain time	dr00 ~ dr10min.	Clear for Droplet water(dr=Drain)	Drain time	
15.	Defrost chain	dcon / dcoF	Defrost chain ON/OFF(dc=Defrost chain)	Defrost	
16.	Fan delay	Fd00 ~ Fd15min..	Defrost End ⇨ Fan delay time.	Fan delay	
17.	Fan mode	FLln / FULL	FLln=Cooling+Fan/ FULL(Defrost N/A)	Fan mode	
18.	Door/Comp.	door / ConP.	Door open / Comp. Fault check	Alarm	
19.	Light mode	nton / ntoF	Light time set "ON/OFF"(Y/N)	Light	
20.	Light "ON"	00:00 ~ 24:00	Light "ON" time setting.	Light	
21.	Light "OFF"	00:00 ~ 24:00	Light "OFF" time setting	Light	
22.	Time setting	00:00 ~ 24:00	Real time adjusting.	Present time	
23.	Visual temp.	CELS / FAhr.	CELSius / Fahrenheit.	Display	
24.	Address Nos	A000 ~ A255.	Set the each number(A=Address)	Controller	
25.	Bore rate	r012 ~ r192.	1200/2400/9600/19200 4steps(r=rate)	Communicat'n	
26.	Lock mode	SAFE / UnSAFe.	SAFE=Lock / UnSAFe=Unlock.	Data hold	
27.	ON/OFF	on / OFF	Working "ON / OFF"	-----	

◆. Descriptions for all the functions.

1. Selection value(1) : Please set a proper temperature for the chamber.(S.V.)
2. Differential value(2) : Using S.V.(1) as base, high or low is applied.
   This function of Dif(diferential=hysterisis) need to be pressed the "SET" button 5-seconds on the "SV" flag..
3. Temp. Calibration(3) : It corrects for present temperature base.(Ca.)
4. Time Delay(4) : Defrost is delayed for the set time(minutes) and the proceeds. (Pressure release). Delay time is applied from the time if cooler "OFF". Please set for more then 1-minute in normal operations.(T.D.)

5. Alarm High/ Low(5, 6) : Alarm High or Low point temperature is set.(HI, LO)
6. Alarm Delay(7) : Alarm delay time is applied from Alarm "ON" time. When Alarm relay and buzzer are turned "OFF", after A254 please set to "AL:OFF". Except, if sensor malfunctions, It operated immedeatedly.(A000)

7. Alarm mode(8) : Select either AL-Continuous or AL-Flick.(AL-C/AL-F)
8. Alarm Buzzer(9) : Only the Alarm Buzzer can be "ON/OFF.(Alarm Relay operates).(b on/oF) When Alarm is operating, as High(-HI-), Low(-LO-), it is displayed with the present temperature in the alternating fasthion.(b on/oF). Alarm stops when "▲" button is pressed, and it is automatically reset within the High/Low selected range.

9. Defrosting method(10) : please select either of "Electric Heater/Hot gas".(HEAt/Hot).
10. Defrosting cycle(11) : Please select either "Int"=interval or "rtc"=real time control for a defrost cycle.(Refer to next page)
11. Defrost temp.(12, 13) : Select the expected defrost termination temperature & time(sensor2)

12. Drain time(14) : this is drying time of the water remaining in the Evaporator after the termi--nation of defrost. Defrost "Interval" restarts from the drain termination time. During defrost and draining, it is displayed as "dEFr", and after the start of cooling it is displayed for 10-minutes and displayed. Even within 10-minutes, if the chamber temperature is lower than the Set(1) temperature, present temperature is displayed. The drain pipe heaters for terminal numbers 17 and 18 are operated for 30-minutes after the termination of defrost.
13. Defrost Chain(15) : Select either the Defrost chain(dc:on)=group or single mode.(dc:oF).

14. Fan Delay(16) : After the termination of draining, from initial Cooling time the Fan delay time is applied.(Fd00)
15. Fan mode(17) : "FLln=Fan Link" interlocks Fan and cooler, and "FULL" operates Fan during the entire process. Except, during defrost or drain(Evaporator) are stopped.

16. Door/Comp(18) : Terminal numbers 13 and 14 are operated by receiving external "ON/OFF" signals, select whether Door/Comp. is for checking Door open or Comp. Fault. If cooler is malfunctioning, Cooler, Defroster and Fan outputs are stopped, and when it is functioning normally, they recover automatically. If the checking function for Door open or Comp. is not needed, then the terminal numbers 13 and 14 must be shorted.

17. Night set-back(19~21) : please set operational status and Light "ON/OFF".(nton/ntoF) Cooler is operated normally in Light "ON~OFF" segment, and it is operated in sleep mode in Light "OFF~ON" segment by adjusting higher the same as S.V(1)+Dif(2).
18. Real time(22) : Please set time after completing all the setting values.
19. Celsius/Fahrenheit(23) : Temp. is displayed with "CELS" or "Fahr" depending on the setting.

20. Address Nos.(24) : If it is controlled in a personal computer, the unique numbers that are assigned to each of the controllers must be sequentially to avoid being duplicated. (Communication hindrance). When it is controlled in a computer, a communication program needs to be installed for operation.

21. Bore rate(25) : It needs to be set for the same values as those of all the installed controllers and computer.(r012~r192)
22. Lock(26) : when protecting the setting Data, if it is set for "SAFE=Lock", then it is impossible to correct. When correcting "UnSAFe=Unlock" mode must be checked before resetting.
23. ON/OFF(27) : please select, if individual operation or stop is needed.(on~0FF)

★. Whenever the "SET" button is pressed. The next function will be chosen.
. But the function of Dif(Differential=Hysterisis) needs to be pressed the "SET" button
. 5-seconds on the "SV" flag. A function has been selected by the "SET" button. Adjust
. a required value of a direct parameter with the "▲/▼" button. And then the "SET"
. button must be pressed again to finalize the new setting that has just been set by the
. "▲/▼" button. Once a function has been chosen, press the "▲/▼" button to correct the
. value of a direct parameter while the flag light blinking.

★. Although either a function has been selected, or a correction has been comleted by
. the "SET" button. There is no slight alternation at all.
. After 20-seconds, the mode will automatically be return to a position that the present
. temperature is shown on the window. In case, the value of a direct parameter are to
. be scrolled up or down swiftly. Keep on pressing the "▲/▼" button.

★. When the "Set" button is pressed while the "❄" button is pressed, each function
. becomes set in the reverse direction.
★. In case when the verification of the "Door open or Comp. fault is not necessary,
. please short the terminal nos. 13 and 14.
★. Inner Relay must be used at all cost for the operation of magnetic cell.

1. Please wire the 12Vac/dc input power supply to the temperature controller.
2. When the initial chamber and defrost sensor are wired, "door and present temperature"
. (Chamber) are displayed on the front view. If the verification of door open/cooler(18)
. malfunction is not needed, Please short the terminal No.13 and 14.
3. Examine each mode(function) using the initial setting values and wire to the necessary
. output terminals.

4. Pump down(4) starts defrosting after being delayed by the amount of time set(minutes)
. before starting the "Pr00=Protect" defrost operation. Please set the time longer than
. 1-minutes to protect the Cooler side from frequent operations caused by external noises
. or temporary power failures.
5. Alarm check should be set last after checking the alarm delay(7) in "A000=Zero".
. Alarm delay does not work in case of a malfunction in the sensor or Cooler side, and
. alarm delay operates immediately.

6. For defrost check, Please check the operation status of defrost by setting the defrost
. termination temperature(12) to "E50.0°C". If it is lower than the defrost sensor temp-
. -erature, then defrost termination is assumed and draining time is applied.
. Estimated defrost termination time(13) supersedes estimated defrost termination temp-
. -erature and terminates defrost operation when the set time elapses.
7. Defrost interlock(15) must be set to "deon"(de=defrost chain "ON"), in case when
. multiple temperature controllers are simultaneously interlock with defrost start and termi-
. -nation. In case of individule operation stops during interlocked operation, Please set to
. "dcoF"(dcoF=defrost chain "OFF").

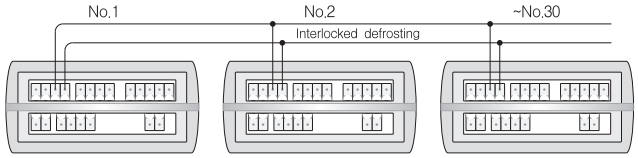
8. For defrost interlock, terminal 15 and 16 must be wired to the same number terminals
. during control period. Using the first selected controller as base among the interlock
. controllers, defrost is started at the same time. Individulaly terminated controllers will be
. on standby until the last controller is termainated. During time is applied from the time
. the controller is terminated, and when draining time is terminated, all controllers will be
. converted into Cooling mode. Group interlock is for cases with somewhat similar condi-
. -tions. Interlock contollers must be set with same values.

9. Individual temperature controller "ON/OFF" can be selected in Mode No. 27.
10. Please wire terminal numbers 18, 20 and 25 as common.
11. For intinalizing internal timer in operation, Please press 4 front buttons simultaneously.
12. Internal relays must be used for driving the magnetic switch coil.

Method for defrost Int./Real time setting

★. [intt] ▲/▼ [rtt2] (SET) = select among the Interval/Real time controls.
1. [intt] (SET) [1.no] ~ [n255] (SET) Select the defrost interval(/hour)
2. [rtt2] (SET) [St:01] ~ [St:99] (SET) Select a number(Step) among 24hours
[St:01] / [0000] (SET) when the step number and time are flashing alternatively, after selecting time(/10-minutes)
Press (SET), next (SET) to select the time sequentially.

Defrosting Data



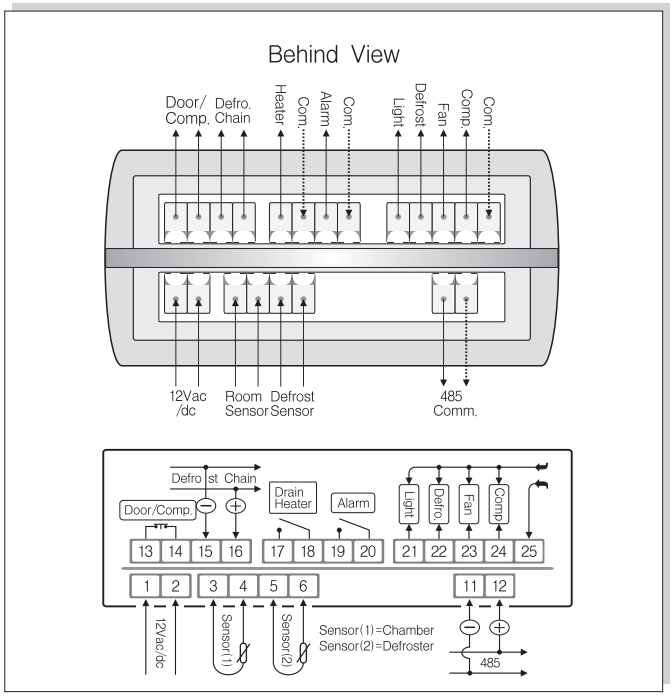
1. In cases when the defrost and cooling time are proceeding simultaneously,
. the terminal 15, 16 need to be connected with the same numbers.
. The controller that starts defrost first and the controller that is interlocked for
. defrost are to start the defrost at the same time. After completing the drain
. time of last controller, the controllers that are interlocked for defrost are to be
. switched over to cooling mode at the same time.

2. In case of group interlock, for the defrost cycle, select the same Interval or time.
3. During operation, the "▲" button shows the Cooler side(sensor1) and the "▼"
. button shows defrost side(sensor2) temperature.

4. By defrost, drainage and by delaying 10-minutes, it is indicated with "dEFr".
. Even if it's within 10-minutes, when the chamber temperature reaches the selected
. temperature(SV) after drainage, it is changed to the present temperature(Sensor1).
5. Manual defrost, "❄" button is pressed for 5 seconds, defrost becomes "ON/OFF".
6. The drain interlock prevention Heater on the exit side is interlock for defrost and
. draining. It operates for 30-minutes on delay(terminal Nos 17, 18).

Defrosting [dEFr] Sensor(1) fault [Err1] Sensor(2) fault [Err2]

Door open [door] Comp. Error [CErr] No working [OFF]



1. You may experience frustration when you test various sequence by inputting
   . Power supply to this prodects.
   . This prodect is not operated according to your intention but according to the
   . controller's intention to consider foremost the equipment/facility safety.

2. With this prodect, external setting of almost all the internal data, which are
   . needed internally, is possible, and the controller can be made to be less
   . sensitive if necessary. This prodect must be operated by a skilled engineer
   . who has a thorough understanding of this entire sequence.

3. Who this prodect is controlled by a computer, are almost sequence that need
   . to be handled by the computer.

◆. MPFM(Momentary Power Failure Management)

★. The MPFM function is a function that prevents damage only to Wooree Electronics's
. temperature controllers.
. Compressor is operated by condensing a high pressure refrigerant gas with motor
. as its operational principle and it does not take a large force when is initially started,
. however, if it is suddenly stopped and then immediately restarted, this can be very
. dangerous and can cause costly damage.
. A complete compensation program for restart upon power failure is built into Wooree
. Electronics's temperature controllers(Aum-2KN26C).
. The functions are described by dividing into the following cases.

1. Compensation for defrost cycle :

. Q : Most refrigerators need defrosting and melt the ice periodically(e.g., 6-hours),
. in order to prevent efficiency reduction due to freezing of th evaporator.
. Defrosting is done by using an electrical heater of by reversing the pressure
. direction in compressor(Hot gas).
. For example : if a power failure occurs when the controller is counting the defrosting
. cycle internally, it will count again because it loses accumulated elapsed time up
. to then, therefore defrosting is not done up to twice the amount of the elapsed
. time.
. A : MPFM applies the time elapsed until now if power failure does not exceed 30-
. minutes, and it resets the counter if power failure exceeds 30-minutes.(If power
. failure lasts more than 30-minutes, it is recognized to have been defrosted naturally)

2. Preservation of compressor protection delay :

. Q : When compressor operates repeatedly for temperature controller, if it is operated,
. stopped and then restarted immediately due to external noise or instant power
. failure without a certain delay time, a damage to the compressor can occur if it
. is instantly restarted from the maximum pressure state.
. A : When power supply is inputted again within a time range shorter than the set
. delay time after a power failure, MPFM automatically reapplies a delay time.

3. Preservation of sequences during defrost :

. Q : If an instant power failure occurs when defrost mode has been restarted after
. waiting a long time(e.g., 6-hours), then it is impossible to conduct the defrost
. function since it is already out of the defrost mode.
. A : If power failure recovered within 10-minutes, MPFM is reverted back to the
. previous defrost mode. Although in Heater mode, if the compressor is stopped
. due to power failure during operation in Hot gas mode, a protection delay time
. is applied again provided that a power failure time is shorter than the set delay
. time.

※. In any situations, the compressor will not be pressurized upon restarting caused
. by the controller being down due to an instant power failure.

※. This function is achieved by applying the technique of maintaining internal count
. data for more than 1-year even through power failures, The data required to be
. maintained during power failure is stored in 1-second intervals but the time is
. controlled in minutes rather than seconds.