

Beverage Cabinet Controller ETC-66 Operation instruction

1. Main functions:

- 1) Cabinet temperature control: control temperature according to setting value+upper return difference, it could set the increased temperature value in standby mode.
- 2) Defrost control: defrost when the compressor stops, start defrost by defrost cycle and temperature, stop defrost by defrost time and temperature.
- 3) Evaporator fan control: it could be set as continuous running, or run/stop synchronically with the compressor; fan start or stop during defrost is optional.
- 4) Light control: manual switch or auto running is optional
- 5) Run mode: user could set a business time range, when it is electrified, it is always in run mode within the set time. Business mode or non-business mode can be switched by user manually. It is optional whether enable the self adjustment mode.
- 6) Door switch input: it could be set as open valid or close valid, or disenable the door switch input; when door is open, compress or fan stop with alarming is optional.
- 7) Alarming: sensor error alarming and door open alarming.

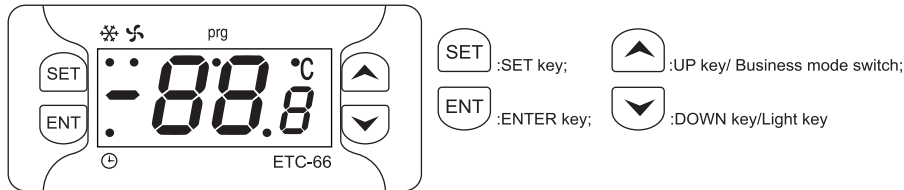
2. Specification:

- ◆ Front panel size: 75(W)X34.5(H)(MM)
- ◆ Product size: 75(W)X34.5(H) X58(H) (MM)
- ◆ Mounting size: 71(W)X29(H)(MM)
- ◆ Sensor wire length: 2M(include probe)

3. Technical parameters:

- ◆ Power supply: 220VAC+15%/-15%,50/60Hz;
- ◆ Measuring range: -40℃ ~ 100℃;
- ◆ Resolution: < 100℃,0.1℃,others,1℃;
- ◆ Sensor error time delay: 10seconds;
- ◆ Relay output capability:
Compressor: 16A/220VAC,could drive single phase loading 1HP/220VAC;
Others: 5A/220VAC
- ◆ Front panel protection level: IP65;
- ◆ Storage temperature: -30℃ ~ 75℃;
- ◆ Power consumption: <3W;
- ◆ Controlling range: -10℃ ~ 50℃;
- ◆ Accuracy: (-40℃ ~ 50℃),±1℃; others,±2℃;
- ◆ Sensor type: NTC;
- ◆ Ambient temperature: 0℃ ~ 65℃;
- ◆ Relative humidity: 20 ~ 85%(Non-condensing).

4. Operation and display panel:



5. Indicator lights status description:

Indicator light	Symbol	Status	Function
Refrigeration indicator light	❄	Flash	Compressor start up delay time
Refrigeration indicator light	❄	Constant on	Compressor start up
Fan indicator light	🌀	Flash	Fan of evaporator start up delay time
Fan indicator light	🌀	Constant on	Fan of evaporator start up
Business indicator light	⊖	Constant on	Currently in business mode
Setting indicator light	prg	Constant on	Currently in parameters setting mode

6. Operation instruction:

1,Check information:

Under the normal working status of the controller, press and release SET key, display "MSr","tMr","MSC" in loop, representing the information of measuring, time and miscellaneous respectively.

When display "MSr", each time press ENT,it will display "P1", "P2", "d1", which represent cabinet temperature, evaporator temperature and door switch status. Release ENT, it will display its corresponding values. Whenever sensor error, it will display "---". For door switch status,0 represents door close,1 represent door open and when the door switch is disenabled, it displays "---".

When display "tMr", each time press ENT, it will display "HUr", "Min" in loop, which respectively represent Hour and Minute. Release ENT,it will display its corresponding value. Whenever it fails to obtain the valid time data,it will display "---".

When display "MSC",each time press ENT, it will display"Mod","nUM","rEL" in loop,which respectively represent product model(ETC),serial number of the model(066),software version(015 represents V1.5).

In the status of checking the system information, press other key or no operation within 15 seconds,it will return to its normal display status.

2, Parameter settings:

Under the normal working status of controller, press SET key for more than 3 seconds,it displays the first parameter "F01"and at the same time the indicator light will be on. Release the keys, press ▲ key or ▼ key to upward or downward adjust and display the menu codes. Press and release SET key to display the current value under this menu code, then press ▲ key or ▼ key to upward or downward adjust and display the current parameter value, press and release SET key again, it will return and display the next parameter code.

Hold down ENT key for more than 3 seconds to save parameter and return to normal display status, within 30 seconds if no key operation is not to save the modified parameter and return to normal display status directly.

For parameters which need a delay time or time cycle, its modified parameter could take effect immediately when you disconnect the power and electrify the power again, without the need to wait for the finish of current time delay or time cycle.

If an error occurs when you save the parameters, "Err" will be displayed, 3 seconds later it will return to normal display status.

3, System clock setting:

Under the normal working status of controller, press ENT key for more than 3 seconds, it displays the first clock code" HUr ", and the setting indicator light on, then release ENT key. Under the status of displaying the clock code, press and release SET to display the current clock code value, then press ▲ key or ▼ key to upward or downward adjust and display the clock value. Press and release SET key again, it will return and display the next code under the clock menu. Code" HUr" means to adjust hours and "Min" means to adjust minutes.

Hold down the ENT key for more than 3 seconds to save the time and return to normal display status. If no any key operation within 30 seconds, the clock data will not be saved and directly return to normal display status.

If an error occurs when you save the clock parameters, "Err" will be displayed, 3 seconds later it will return to normal display status.

4, Manual switch between business mode / non-business mode:

Under the normal working status, if the self adjustment mode is not enabled, or enable the self adjustment mode but the door switch input is disenabled, hold down ▲ button for more than 3 seconds, it will switch between business mode / non-business mode, then press ▲ key again for more than 3 seconds, or operate it on the second day, it will run according to set business time range. When the system fails to obtain a valid clock data, it can not automatically revert to run according to the set business time range.

5, Manual open/close lighting modes:

When the controller is under normal working status, if the lighting mode is in manual switch, then it permits the user to manually open or close the lighting. Hold down ▼ button for more than 3 seconds, it will manually switch lighting modes to be open or close. And the lighting status set in the manual mode will be saved in the controller. If there is any error during the saving, it will display "Err" , 3 seconds later it will return to normal display status.

When it switches to all day open, display "LoN"; switch to all day close, display "LoF", 3 seconds later it will return to normal display status.

6, Restore system data:

When the device is electrified, firstly check whether parameter settings are correct. If an error is found, it displays "Err". At this time, pressing any key will restore the parameter to the default value and back to normal working. It is recommended to re-set parameters at this time.

7, Use copy card:

Disconnect the controller power supply, insert the copy card into the K-BUS of the controller, and re-connect power supply, the parameter settings in controller will be substituted to the data in copy card, and display "toM" at this time.

During parameter substitution, if there is an error, it will display "Err", at this time you need to check copy card's model No. or check whether the data in copy card is correct, then you need to initialize the system data. When finish parameter substitution, it will be back to the normal working status.

When the controller is under normal working status, insert the copy card to the K interface of comptroller, press and immediately release ▲ key, the parameter settings in copy card will be substituted by the data in the

controller and display "toC" at the same time. When finish parameter substitution, it will be back to the normal working status.

During parameter substitution, if there is an error, it will display "Err", 3 seconds later, return to normal display status. At this time, you can try parameter substitution again or unplug the copy card to test whether it is the wrong model No. or whether it is damaged.

7. Control output:

1. Refrigeration:

Business time should set according to the opening hours for the customers. If open time and close time are set as the same, it is in all day open mode. In business hour, it runs in the run mode, and in non-business hour, it runs in standby mode. If pre-refrigerating time before business open is set, it will enter the run mode before business start time; if standby in advance time is set, it will enter the standby mode before business close time. In the lasting running time after electrified, it will control the temperature in the run mode.

When self adjustment mode is enabled, the controller will determine whether need to adjust to business mode or non business mode according to the actual door open or close status. In business hour, during the set time, if there is no door switch, it will switch to non business mode automatically, in this status, if the door switch number of times exceeds the set times, it will exit from non business mode automatically and return to its normal control status. In non business hour, if the door switch number of times exceeds the set times, it will switch to business mode automatically, in this status during the set time, if there is no door switch, it will exit from business mode automatically and return to its normal control status.

In the run mode, when the cabinet temperature is higher than the temperature set value in the run mode + temperature control return difference in run mode, the compressor starts, when the temperature falls back to the temperature set value in the run mode, the compressor stops; in the standby mode, when the cabinet temperature is higher than the temperature set value in the run mode + increased temperature values in standby mode+ temperature control return difference in standby mode, the compressor starts, when the cabinet temperature falls back to the temperature set value in the run mode + increased temperature values in standby mode, the compressor stops.

When there is cabinet temperature sensor error, the compressor runs as the proportion of start 8 minutes and stop 16 minutes in the run mode, and the compressor runs as the proportion of start 8 minutes and stop 32 minutes in standby mode.

When the controller is electrified or after the compressor shuts down, the compressor will not be permitted to start until the compressor protection time is finished.

2. Defrost:

Defrost type is defrost after compressor stops. The defrost cycle calculation methods could either be the accumulated time after electrified or compressor lasting working time after electrified, or evaporator low temperature lasting time after electrified. when it defrosts per the accumulated time after electrified, the defrost cycle calculation will not be limited by the compressor status(start or stop); when it defrosts per compressor lasting working time after electrified, it will not defrost until the lasting time of compressor working time exceeds the defrost cycle; when it defrosts per evaporator low temperature lasting time after electrified, it will not defrost until the lasting time of evaporator temperature lower than frost temperature exceeds the defrost cycle. within the defrost time, if the evaporator temperature is higher than the defrost end temperature, defrost will be immediately stops, otherwise, defrost will not stop defrost until the set maximum defrost time is finished. When in defrost, it displays "dEF", after defrost, it will return to its normal temperature display and run the defrost cycle again.

If there is evaporator sensor failure, the defrost starting or stop is not limited by frost temperature and defrost end temperature.

If the defrost cycle calculation methods is set as the accumulated time after electrified. When the controller is electrified, the first defrost starts per the first time defrost cycle, after that, the defrost will start per the normal defrost cycle; if other modes are set, defrost will only start by the normal defrost cycle.

3. Evaporator fan:

Evaporator fan could have four running modes: run or stop synchronously with the compressor, stop when in defrost; continuous running, stop when in defrost; run or stop synchronously with the compressor, start when in defrost; continuous running, start when in defrost.

In the mode of "run or stop synchronously with the compressor", except the situation of door open or needing to close the fan during defrost, the evaporator fan will not be closed until runs out the Fan close delay time after compressor closes. When the controller is electrified, it is not permitted to start evaporator fan until it runs out the compressor protection time.

4. Lighting:

When the lighting mode is in manual switch, the lighting status will be controlled by users manually; when the lighting is in auto running, the lighting will be on in the business mode, the lighting will be off in the non-business mode. If permit to the light when door opens, then the light will be on automatically when the door opens, when the door closes, it will return to its normal lighting control after runs out the set lighting close time delay.

When the self adjustment is enabled, to avoid the frequent open/close of the lights, in the auto control lighting mode, once the light opens, it will not be closed within the set shortest lasting time.

If the light is fluorescent lamp or energy saving lamp, it is suggested to set the lighting mode as "manual

switch" or "auto control, no effecton when door open"; when the light is LED, it is suggested to set the mode as "manual switch" or "auto control, light on when door open".

5. Alarm:

When the door is open, the controller will stop fan or compressor according to the setting parameters. When the door open time exceeds door open alarming time delay, the door open alarming occurs, it display the code "dor" and normal display in turn; When the clock is in error and the control related with the clock fails, the alarming code"E00" and the normal display will be shown in turn; when the cabinet temperature sensor error, it will display the alarming code"E01";evaporator sensor error displays alarming code "E02". if the audible alarming is chosen, then when a new alarming occurs, the buzzer will beep, the buzzer stops when press any key or the buzzer beeping time finished.

8. Menu description:

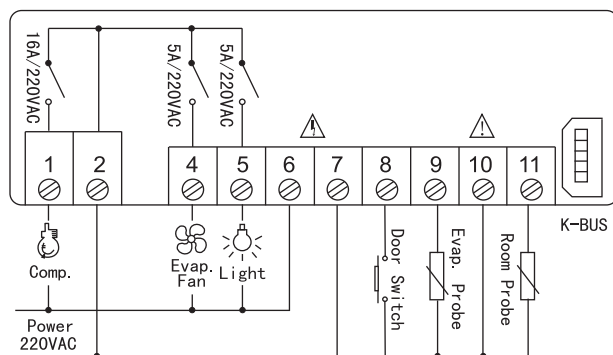
Menu items	Menu function	Setting range	Resolution/Unit	Default
F01	Business start time setting	0.0 ~ 23.5	1Hour.10Minutes	8.0
F02	Business close time setting	0.0 ~ 23.5	1Hour.10Minutes	21.0
F03	Run mode lasting time when electrified	0 ~ 48	1Hour	24
F04	Pre-refrigerating time before business hours	0 ~ 240	1Minute	60
F05	Standby in advance time	0 ~ 240	1Minute	60
F11	Temperature value in run mode	-10 ~ 50	0.1℃	3.0
F12	Temperature control return difference in run mode	0 ~ 10	0.1℃	3.0
F13	Increased temperature value in standby mode	0 ~ 10	0.1℃	3.0
F14	Temperature control return difference in standby mode	0 ~ 10	0.1℃	3.0
F15	Compressor protection time	0 ~ 30	1Minute	3
F21	Defrost cycle calculation: 0: accumulated time after electrified; 1: compressor lasting working time after electrified 2: evaporator low temperature lasting time after electrified	0 ~ 2	None	2
F22	First time defrost cycle	0.1 ~ 40.0	1 hour.10minutes	6.0
F23	Normal defrost cycle	0.1 ~ 20.0	1 hour.10minutes	3.0
F24	The maximum defrost time	1 ~ 240	1Minute	30
F25	Frost temperature	-20 ~ 20	0.1℃	4.0
F26	Defrost end temperature	0 ~ 80	0.1℃	10.0
F31	Fan run mode: 0:run or stop synchronously with the compressor, stop in defrost 1: continuous running, stop in defrost 2: run or stop synchronously with the compressor, start in defrost 3: continuous running, start in defrost	0 ~ 3	None	2
F32	Fan delay close time after compressor	0 ~ 240	1Second	0
F41	Door switch setting: 0: door open, switch on 1: door close, switch off 2: door switch disenabled	0 ~ 2	None	2
F42	When door open, the status of compressor and fan: 0: no effecton 1: stop compressor 2: stop fan 3: stop compressor and fan	0 ~ 3	None	3

F43	Door open alarming time delay	0 ~ 240	1Minute	15
F51	Cabinet sensor temperature calibration	-10 ~ 10	0.1℃	0.0
F54	Lighting mode: 0:manual switch; 1:auto control, no effect when door open 2: auto control, light on when door open	0 ~ 2	None	1
F55	Light close delay time after door close	0 ~ 240	1Minute	1
F58	enable audible alarm: 0:NO; 1:YES.	0 ~ 1	None	1
F59	Buzzer beeping time	1 ~ 240	1second	60
F61	auto adjustment to non business mode time if no door switch	0.1 ~ 24.0	1 hour.10minutes	2.0
F62	Door switch Number of times for auto adjustment to business mode	1 ~ 30	none	1
F63	Shortest light time in self adjustment mode	0.0 ~ 24.0	1 hour.10minutes	3.0
F64	enable self adjustment mode: 0:NO; 1:YES	0 ~ 1	none	0

9. System code, cause and result:

Code	Cause	Result
Err	Data Access Failure	None
E00	System clock failure	Control related with clock invalid
E01	Cabinet temperature sensor error	Run or stop compressor in proportion
E02	Evaporator sensor error	Defrost is not effected by evaporator temperature
dor	Cabinet door open in a long time	Act per setting and alarm
dEF	In the process of defrost	Compressor stops and fan acts per setting

10. Wiring diagram:



11. Safety Rules:

★ Dangerous:

- 1, Strictly distinguish among the sensor lead wire, power wire and output relay interface, and prohibit wrong connections or relay overloading.
- 2, Prohibit connecting the wire terminals without the electricity cut-off.

★ WARNING:

- 1, Prohibit using this unit under the environment of over damp, high temp and strong electromagnetic interference, or strong corrosion.
- 2, The connectors for this controller and its K-BUS adopt the standard 5P mini USB connectors, but its electrical specification, pin configuration and communication protocol are different with the standard USB. Please use our dedicated copy card (optional) to connect the controller. If other devices are connected, it will cause the damage for the controller.

★ Note:

- 1, the power supply should confirm with the voltage value marked in the unit, to ensure the stability of supply voltage;
- 2, In order to avoid possible interference, the sensor lead wire and power wire should be kept in certain distance.
- 3, In order to reach an optimum energy saving effect, please reset the system clock for the initial use and every six months.
- 4, In order to maintain the normal working of clock, please continuously charge for the standby battery for more than three days before long time power cut-off or after one year's power cut-off.

APPENDIX1:CHARACTER SET

