ECB-200 Instruction

Dear customers:

Thanks for your choosing my company's products: ECB-200 is a newly designed product after lots of market research and consideration of customer's advice. We are confident that ECB-200 must meet your requirements:

1. Strictly according to National standard (GB)
2. Especially designed for refrigerated Units
3. Use famous brand Low voltage electronics
4. Complete and reliable multi-ply protections
5. More advance, more reliable and more stable

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Before use please read this instruction carefully. It will better your understanding on ECB-200 and its functions, avoiding mistakable operations and incidents, prolong its using time.
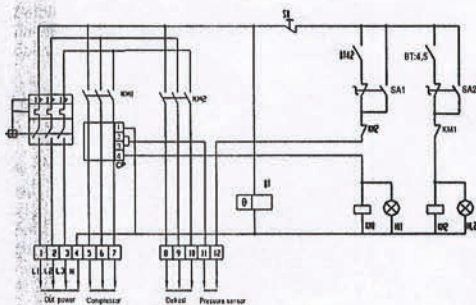
Ⅰ、Features and functions:

1. Use high stable USA Microchip PIC to increase the system stability and anti-interference ability
2. SMT&THT assembly technology, optimizing programming design and multi hardware solutions to better the system's anti-interference ability
3. Can reset the parameters when the system is still running without stop.
4. Manual/Auto switch functions, when manually operate, can control the load of Fan, Compressor and Defroster separately
5. Compressor starting delay functions
6. Defroster auto/manual defrosting functions
7. Control ability when pressure, overload and phase lacking error
8. Main heavy current controllers are used domestic famous brands with high reliability
9. With good waterproof ability

Ⅱ、Model and Specification

Model Type	ECB-200										
		1									
Host Voltage supply		380V AC 50Hz	220V AC 50Hz								
Control unit Power Supply		11									
Maximum allowed Load	Compressor	Watt (kw)	11								
		Current (A)	25								
	Defrost	Watt (kw)	5.5								
		Current (A)	12								
Dimension (mm)		L	360								
		W	250								
		H	150								
Suited Unit (HP)			≤9								
Gross Weight (Kg)			6								

Electric principle and Elementary diagram:

Ⅳ、Instruction of Temp. Controller

Specification:
Out case: ABS fireproof plastics
Size:
Panel: 34.5(H)×75(L) (mm)
Advised mounting size: 30(H)×71(L) (mm)
Protection guard: IP65
Operation environment
Operation temperature: -5℃～+55℃
Stored temperature: -10℃～+65℃
Relative humidity: 20%～95% (No condensate)

Main technical parameters:
Power supply: 220VAC±10% 50～60HZ
Power consumption: ≤3VA
Temperature measuring and controlling range: -40℃～+50℃
Resolution: 1℃
Sensor: NTC sensor with jacket wire 5m
Compressor output contact capacity: 7A/240VAC
Defrosting output contact capacity: 7A/240VAC
Alarm output: Buzzer and LED flash
Delay protection time: 3 minutes
Temperature calibration range: ±5℃
Alarm adjustable range when temperature exceeding limit: 0℃～20℃
Defrost cycle: 0～99 hours adjustable
Defrost time: 0～99 minutes adjustable

Indicator light description:

Indicator light	Color	Status
Refrigerate Indicator light	Red on	Auto refrigeration run
	Red flash	Forced refrigeration run
Defrost indicator light	Red on	Auto defrosting run
	Red flash	Forced defrosting run
Set indicator light	Red on	Parameters setting status

Key functions:

1. See parameters setting mode: under non-setting status
   Press ▲ key to display set temperature upper limit value for 2 seconds, then display current temperature
   Press ▼ key to display set temperature lower limit value for 2 seconds, then display current temperature
   Press "SET" key to display defrosting cycle and then display defrosting time each for 2 seconds, and then display current temperature
   Press "Rst" key, not valid.
2. Parameter setting mode:
   Press "SET" key for 3 seconds into parameter selection modes, setting indicator light on; LED displays current parameters.
   Press ▲ or ▼ key to select parameter items(F1,F2···F6), after select the parameter item, press "SET" key to display relevant parameter values.
   Press "SET" key and ▲ or ▼ key together to modify the parameters value. If press the ▲ or ▼ key continuately it will speed up the modifying of the parameters.
   When finishing one parameter item, press ▲ or ▼ key to select other parameters, repeat as above to modify all parameters.
   When finishing all parameters, press "Rst" key to confirm and restore, then indicator light off.
   If no key-press for 30 seconds, system will automatically confirm and store the parameters, and then Indicator light off.

Refrigeration、defrosting and temperature calibration:

1. Refrigeration and auto defrosting
When temperature sensor measuring value ≥ set upper limit, refrigeration relay closed to start refrigeration compressor; When temperature sensor measuring value ≤ set lower limit, refrigeration relay open to stop refrigeration compressor; when comes to the defrosting cycle time, defrosting relay close to defrost. When run out the defrosting time, defrosting relay open to stop.
2. Forced defrosting
When need forced defrosting function, press ▼ key for 3 seconds to start it. Press ▼ key again for 3 seconds to quit from it. If not manually quit, it will auto defrost by the set parameters and then quit till the defrosting time comes.
3. Cancel defrosting function:
If set defrosting cycle or defrosting time "0", then cancel the defrosting function.
4. Temperature calibration:
When the measuring value of temperature controller has error with the practical value, users can use Temperature calibration function to modify. Press "SET" key for 3 seconds into setting status, press ▲ or ▼ key to select F3, and then press "SET" key and ▲ or ▼ key together to modify. The setting range is within ± 5℃. The value after calibration= the value before calibration + calibration value

Delay protection:
When electrify, system delays for 3 minutes into refrigeration status. On electrifying status, the interval between two close refrigeration relays ≥ 3 minutes.

Alarm:
Sensor error alarm:
When temperature sensor open circuit or short circuit (including not firmly contacting with the host), temperature controller into alarming status, buzzer on, LED displays "44" and flashes. Press any key to eliminate the alarming sound. If do not press any key, the alarming sound will last till error repaired.
Alarm when exceeding temperature limit:
The alarm setting arrange of exceeding temperature limit is 0～20℃. When temperature sensor measuring value ≥ upper limit + set value of exceeding temperature limit or ≤ lower limit - set value of exceeding temperature limit, temperature controller into alarming status, buzzer on, LED flashes. Press any key to eliminate the alarming sound. If do not press any key, the alarming sound will last till the temperature returns into set arrange.
Alarm when exceeding measuring range:
The measuring range of temperature controller is -40℃～+50℃. When temperature ≥ 50℃, LED displays "HH", when temperature ≤ -40℃, LED displays "LL".

Parameter instruction and set:

Code	Function	Set range	Default	Unit
F01	Temp. upper limit	-39～+50	-18	℃
F02	Temp. lower limit	-40～+49	-22	℃
F03	Temp. calibration	±5	0	℃
F04	Defrosting cycle	0～99	6	Hour
F05	Defrosting time	0～99	30	Minute
F06	Alarm when exceeding temp. limit	0～20	15	℃

Ⅴ、Mounting requirements:

1. ECB-200 should be mounted by professionals
2. Abide to the universal electronics mounting regulations
3. ECB-200 should be mounted in the environment of ventilating、dry and no direct sunshine places
4. Prohibit to get close to condenser or other heat fountains
5. Should avoid high magnetic field and other interfering fountains
6. Can select inflatable bolt to fix the ECB case
7. All connections of wires should be according to the elementary diagram
8. Sensors should be connected separately. Keep distances from other heavy current wires, suggest that the sensor be mounted in the place where is ventilating and keeps about 20centimeters from back of evaporator.
9. Keep the case of ECB-200 touching the ground firmly

Ⅵ、Description of Motor compound Protector

1. Connect well the power wire、load wire and pressure signal wire according to the Elementary diagram
2. Place each switch into " STOP"
3. Close up the switches of out power, and then inner power
4. Manually control the compressor and fan, the Motor works normally. The indicating light on the panel is on.
5. Rotate the right current modifying switch anticlockwise till the overload indicator light on, then rotate back a little clockwise till the status when the indicator does not flash for one minute.
6. Rotate the left current modifying switch till to a proper place according to practical use.
7. Then restart the Motor till it works normally, alarming light off. Then make the Motor overloaded, and alarming light on. Now the whole debug process finished.
8. If no load connected to the protector the contactor can't work because it can't feed and will be processed by phase lack.

Ⅶ、Notices:

1. The connected load of ECB Units can't be over the Max. allowed load.
2. Before use, the current of Motor compound Protector should be modified to proper value according to practical load.
3. Auto running status: make all switches in the ECB-200 cases on "AUTO" places.
4. Manual running status: place AUTO/MANUAL switches into "MANUAL" place, then modify the switches of refrigeration, defrosting and fan to set the single load value.

Ⅷ、Common errors and repairs

Error		Reason	Repair
1	Display "44"	Temp. sensor short circuit or open circuit	Check temp. sensor or replace a new one
2	Temp. flashes to display and sound alarms	Temp. exceeds limit	Check exceeding limit set value and unit working status
3	No defrost	Defrosting cycle and time set with "0"	Reset defrosting cycle and time
4	Compressor doesn't work	Disconnect Emergency button	Disconnect Emergency button and then reset
		Phase-lock protection when overload and pressure	Check the load and power
7	Temperature controller works normally but alternative current contactor can not work	Disconnect Emergency button	Disconnect Emergency button and then reset
		Alternative current contactor coil broken	Check and replace a new one
8	Temperature controller can not display	ECB-200 Connecting ends L1 with no power supply	Check power supply
9	Temperature controller can not work	Temperature controller broken	Replace a new temperature controller or operate manually for emergency

Ⅸ、Warranty and after sales services

1. Warranty time: Temp. Controller free to repair within one year from the purchasing day; other units for 3 months.
2. Warranty unavailable:
A: operations not according to the instruction
B: not right repair
C: Man-made mistake or wrong use or change the system
D: Without the buying certificate like Invoice..
3. We will offer you professional、efficient and prompt services.
4. Technical service telephone: 013196816869