

## Functions:

- Functions of compressor:
  - Under electric-heating defrost mode:
    - Start-up condition: Relay of compressor connects when meet both a) and b) or both a) and c).
    - Compressor delay time exceeds the set delay time.
    - Enforced refrigeration starts when Room temp. is higher than Set temp.
  - Under non-defrost mode, Room temp. is higher than Set temp. + Return difference.
- Stop condition: Relay of compressor disconnects when meet any of the ff. conditions.
  - Room temp. is lower than Set temp.
  - At start-up of defrost.
  - Enforced refrigeration stops.
- Under thermal defrost mode:
  - Start-up condition: Relay of compressor connects when meet both a) and b) or both a) and c) or both a) and d).
  - Compressor delay time exceeds the set delay time.
  - Under non-defrost mode, Room temp. is higher than Set temp. + Return difference.
  - Enforced refrigeration starts when Room temp. is higher than Set temp.
- When defrost.
  - Stop condition: Relay of compressor disconnects when meet any of the ff. conditions.
    - Room temp. is lower than Set temp.
    - At end of defrost.
    - Enforced refrigeration stops and not to start immediate defrost.
- Defrost function:
  - Relay of defrost connects when meet the ff. conditions:
    - Defrost delay time meets the set delay time
    - Defrost temp. is lower than defrost termination temp.
    - Defrost cycle ends or enforced defrost starts
  - Relay of defrost disconnects when meet any of the ff. conditions.
    - Defrost duration time runs out.
    - Defrost probe temp. is higher than defrost termination temp.
- Functions of fan:
  - Relay of fan connects when meet any of the ff. conditions.
    - Defrost temperature is higher than Fan stop temperature and the difference between room temp. and evaporator temp. is higher than the set difference
  - Operation mode "C-n" Compressor starts; Defrost probe temp. is lower than Fan stop temp.; Fan delay time after defrost exceeds the set value.
  - Operation mode "o-n" Under non-defrost mode and the defrost temp. is lower than Fan stop temp.; Fan delay time after defrost exceeds the set value.
  - Operation mode "C-y" When compressor or defrost is working, the defrost temp. is lower than Fan stop temp.; Fan delay time after defrost exceeds the set value.
  - Operation mode "C-y" and the defrost temp. is lower than Fan stop temp.
- Relay of fan disconnects when meet the ff. conditions:
  - The defrost temp. is higher than Fan stop temp.; The difference between Room temp. and Evaporator temp. is less than the set difference.
- Operation mode "C-n" Compressor stops or Defrost starts.
- Operation mode "C-y" Compressor stops.
- Alarm function:
  - LED blinking displays alarming info when Room temp. exceeds Alarm temp. upper limit or lower limit and runs out of the set alarm delay time.
  - LED displays "HH" when Room temp. exceeds the measuring temp. upper limit or probe short-circuit and runs out of probe error delay time. LED displays "LLL" when Room temp. is lower than the measuring temp. lower limit or probe open-circuit and runs out of probe error delay time.
- Operation of COPYKEY
  - Under the controller's work mode, plug into COPYKEY and press  $\blacktriangle$  key to display "UPL" at this time, press SET key to upload the parameters to COPYKEY. LED displays normal temperature after uploading, then turn off the controller and take away the COPYKEY. LED will blinkingly display "Err" if there is error during uploading.

Under the controller's power-off mode, plug into the COPYKEY and turn on the controller, at this time, the COPYKEY will automatically detect the COPYKEY and download parameters from it. LED displays "doW" and display "End" after download. Then turn off the controller and take away the COPYKEY. Then restart the controller. The machine will blinkingly display "Err" if parameter error or controller model error.

6. Key lock function: Under normal mode, simultaneously press  $\blacktriangle$  and  $\blacktriangledown$  keys for 10 seconds to open/close the key lock. At this time, it will display the open or close mode of the keys. Loosen the key-press, LED displays normal temperature and all parameters can be checked but can not be modified.

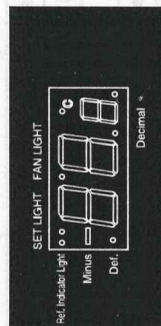
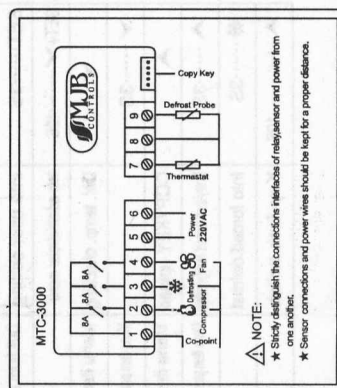
7. MTC-3000 features with start-up output delay function. The default delay time is 1 minute.

8. Modified parameters may take into effectiveness during the next working cycle.

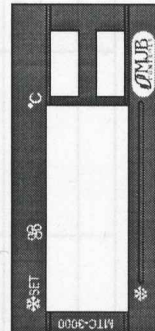
## Indicator light:

| Indicator light | Status      | Function                          |
|-----------------|-------------|-----------------------------------|
| Refrigeration   | OFF         | Compressor stop                   |
|                 | FLASH       | Compressor delay                  |
|                 | ON          | Compressor work                   |
| Defrost         | QUICK FLASH | Enforced refrigeration            |
|                 | OFF         | Defrost stop                      |
|                 | FLASH       | Defrost draining                  |
| Fan             | ON          | Defrost work                      |
|                 | QUICK FLASH | Enforced to defrost               |
|                 | OFF         | Fan stop                          |
| Set             | FLASH       | Fan delay                         |
|                 | ON          | Fan work                          |
|                 | OFF         | Normal work mode                  |
| Celsius         | ON          | Under setting mode                |
|                 | OFF         | Celsius display under normal mode |

## Wiring diagram:



## Front panel:





## MTC-3000 Instructions

### Main functions and features:

- ◆ Control modes among refrigeration, defrost and fan;
- ◆ User menu and administrator menu are separately set, convenient for operation and provide enough space for the adjustment of high-level management;
- ◆ Return difference to control temperature; switch between °C and °F; Resolution of temperature display is 0.1°;
- ◆ Multi-protection and alarming mode optional;
- ◆ COPYKEY function.

### Main technical parameters:

- ◆ Temperature measuring range: -45.5~120°C Temperature controlling range: -45.5~110°C
- ◆ Power supply: 220VAC
- ◆ Relay capacity of compressor: 8A/220VAC
- ◆ Relay capacity of fan and defrost: 8A/220VAC
- ◆ Digital display: Three-digit LED + Minus digit + Status indicator light (Set; Refrigeration; Defrost; Fan)

### Key-press function and set mode:

| Key-press activation | Function 1 (Normal mode)         | Function 2 (User setting mode)  | Function 3 (Administrator setting mode)    | Remark                              |
|----------------------|----------------------------------|---------------------------------|--------------------------------------------|-------------------------------------|
| SET                  | Into user setting                | Into parameter setting          | Save parameter and return to set interface |                                     |
| SET+.....3S          | Into administrator menu          | Quit from setting               | Quit from setting                          |                                     |
| SET+▼.....10S        | Def. temp. checking              | Menu item checking              | Parameter calibration                      | Press SET and hold on, then press ▼ |
| ▼.....3S             |                                  | Menu item promptly go forwards  | Parameter prompt calibration               |                                     |
| ▲                    | COPYKEY upload                   | Menu item checking              | Parameter calibration                      |                                     |
| ▲.....3S             | Entry/exist forced refrigeration | Menu item promptly go backwards | Parameter prompt calibration               |                                     |
| ⊛.....3S             | Into forced defrost              |                                 |                                            |                                     |
| ▲+▼.....10S          | Key-lock switch                  |                                 |                                            |                                     |

### Parameter List:

| Menu               | Item (Character Type) | Range                                                                                                                                                                                   | Default | Remark                                                                              |
|--------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|
| User               | SEt                   | Min. temp. setting-Max. temp. setting                                                                                                                                                   | -5.0°C  | Temp. parameter setting                                                             |
|                    | HY                    | 1.0°C~25.0°C                                                                                                                                                                            | 2.0°C   | Return difference setting                                                           |
|                    | MdF                   | 0~255Min                                                                                                                                                                                | 30      | Defrost time                                                                        |
|                    | ldF                   | 0~120Hr.                                                                                                                                                                                | 6       | Defrost cycle                                                                       |
|                    | LS                    | -45.5°C~SEt                                                                                                                                                                             | -20.0°C | Min. temp. setting                                                                  |
|                    | US                    | SEt~110°C                                                                                                                                                                               | +20.0°C | Max. temp. setting                                                                  |
|                    | ot                    | -10°C~+10.1°C                                                                                                                                                                           | 0.0°C   | Room temp. calibration                                                              |
|                    | oE                    | -10°C~+10.1°C                                                                                                                                                                           | 0.0°C   | Def. temp. calibration                                                              |
|                    | AC                    | 0~50Min.                                                                                                                                                                                | 3       | Compressor delay time                                                               |
|                    | CON                   | 0~255Min.                                                                                                                                                                               | 45      | Room probe emrCompressor work time                                                  |
| Administrator Menu | CoF                   | 0~255Min.                                                                                                                                                                               | 15      | Room probe emrCompressor stop time                                                  |
|                    | CF                    | °C: °C; °F: °F                                                                                                                                                                          | °C      | Temp. measure unit                                                                  |
|                    | tdF                   | EL: Electric-heating; HtG: Thermal                                                                                                                                                      | EL      | Defrost type                                                                        |
|                    | dtE                   | -45.5~49.9°C                                                                                                                                                                            | 10.0°C  | Defrost termination temp.                                                           |
|                    | dFd                   | Rt:Normal display of room temp.<br>In:First start-up temp.<br>SEt:Display set point<br>DEF:Display DEF                                                                                  | Rt      | Display mode when defrost                                                           |
|                    | dAd                   | 0~255Min.                                                                                                                                                                               | 30      | Display delay after defrost                                                         |
|                    | Fdt                   | 0~255Min.                                                                                                                                                                               | 2       | Draining time after defrost                                                         |
|                    | dPo                   | y: Immediate; n: After defrost                                                                                                                                                          | n       | Whether to defrost or not at first start-up                                         |
|                    | dAF                   | 0~24.0 Hr.                                                                                                                                                                              | 0.0     | Defrost delay after enforced refrigeration                                          |
|                    | FnC                   | C-n: Start/stop with compressor, OFF when defrost<br>o-n: Continuous work, OFF when defrost<br>C-y: Start/stop with compressor, ON when defrost<br>O-y:Continuous work, ON when defrost | C-n     | Fan operation mode                                                                  |
|                    | Fnd                   | 0~255Min.                                                                                                                                                                               | 10      | Fan delay after defrost                                                             |
|                    | Fct                   | 0~50.0°C                                                                                                                                                                                | 10.0°C  | Enforced start-up of the difference between fan's room temp. and evaporator's temp. |
|                    | ALU                   | ALL~110°C                                                                                                                                                                               | 110°C   | Alarm temp. upper limit                                                             |
|                    | ALL                   | -45.5°C~ALU                                                                                                                                                                             | -45.5°C | Alarm temp. lower limit                                                             |
|                    | ALd                   | 0~255Min.                                                                                                                                                                               | 15      | Temp. alarm delay                                                                   |
|                    | dAo                   | 0~24.0 Hr                                                                                                                                                                               | 1.0     | Temp. alarm delay after electrified                                                 |
|                    | Cot                   | 0~255Min.                                                                                                                                                                               | 0       | Probe error delay                                                                   |
|                    | FSt                   | -45.5~49.9°C                                                                                                                                                                            | 10.0°C  | Fan stop temp.                                                                      |