

# DEI-104F / 104G Operation Manual

Version 01

SINSL00247

## 1. CAUTION :

- 1.1 Before wiring, please make sure that power is switched off to prevent from getting electric shock.
- 1.2 The product should be avoided to install at humid environment.
- 1.3 To prevent the controller burning out, please make sure the water - proof procedure is undertaken during installation.
- 1.4 Before supplying the power, please always check if the wiring and input power is connected correctly.
- 1.5 Please install according to the wiring diagram, in order to avoid incorrect wiring.
- 1.6 Please always read this instruction carefully before installation. This product is beyond our warranty if any damage is caused by incorrect wiring.

## 2. Specification :

- 2.1 Front panel size : 34.5mm ( H ) × 76mm ( L ) ± 2mm
- 2.2 Mounting hole size : 30mm ( H ) × 72mm ( L ) × 85mm ( D ) ± 1mm
- 2.3 Operating environment temperature : -5°C ~ 55°C , < 90%RH ( non - condensing )
- 2.4 Storage environment temperature : -10°C ~ 65°C , < 90%RH ( non - condensing )
- 2.5 Power supply : AC230V ± 10% , single phase 50 / 60Hz
- 2.6 Power consumption : 104F ( Max. 5 watts ) / 104G ( Max. 10 watts )
- 2.7 Temperature sensing / display range :
  - 2.7.1 -40°C ~ 55°C , accuracy ± 1°C , in 0.5°C step.
  - 2.7.2 -40°F ~ 131°F , accuracy ± 2°F , in 1°F step.
- 2.8 Output / Input :
  - 2.8.1 Sensor : NTC , 1.5m ( L )
  - 2.8.2 Compressor output contact : 7(3)A / 230VAC
  - 2.8.3 Defog output contact : 2A / 250VAC Resistance ( 104G only )
  - 2.8.4 Lighting output contact : 5A / 250VAC Resistance ( 104G only )
  - 2.8.5 Alarm output : Buzzer ( Optional for purchase )

## 3. Function :

- 3.1 Button operation :
  - 3.1.1 Setup mode : In power on status, press and hold **[Set]** key for 3 seconds to enter setup mode, display showing "tS".
    - 3.1.1.1 View Parameter values : When parameter code is shown in display, press **[Set]** key to view parameter values.
    - 3.1.1.2 Select parameter code : When parameter code is shown in display, press **[▲]** or **[▼]** key to select parameter codes.
    - 3.1.1.3 Parameter adjustment : When parameter value is displayed or under rapid setup mode, press **[▲]** or **[▼]** key to adjust parameter value. Whenever there is a switch in °C and °F readout, the controller will restore to their default values.
  - 3.1.2 Rapid setting : In power on status, press and hold **[▼]** key for 3 seconds to enter rapid setting mode.
  - 3.1.3 Enable / Disable defrost manually : In power on status, press and hold **[▲]** and **[▼]** key s simultaneously for 3 seconds to enable / disable defrost manually.
  - 3.1.4 Parameter lockup : In normal status, press **[Set]** and **[▼]** key simultaneously for 3 seconds to lock or unlock parameter setting. After locked, all parameter values can not be adjusted except "tS".
  - 3.1.5 Enable / Disable Buzzer alarms : When alarms is ON, press **[▼]** key to disable alarm output; Press **[▼]** key again to enable alarm output if failure / malfunction has yet to be eliminated.
  - 3.1.6 Restore default values : Press **[▲]** and **[▼]** key simultaneously before power is supplied to restore default values, display showing "tS". After loading default values, the controller reboots.
  - 3.1.7 Cabinet temperature record : In power on status, press **[Log]** key to view max. temperature or min. temperature record, the display will return to display current cabinet temperature after 5s. Press and hold key **[Log]** for 3s, max. and min. temperature record will be eliminated and they will be both recorded as current temperature.
  - 3.1.8 Switch the function of defog and lighting ( only for 104G ) : Press **[▲]** and hold it for 3 seconds to switch the function of defog and lighting and ON / OFF status.

## 3.2 Function instruction :

### 3.2.1 Compressor operation :

- 3.2.1.1 Compressor stops operating whenever cabinet temperature reaches the setpoint ( tS ); the compressor operates when cabinet temperature rises up to setpoint ( tS ) + temperature differential ( td ).
- 3.2.1.2 Compressor delay protection can be set by parameter "AC". The delay time begins to count down whenever compressor is ready to operate; the compressor would not operate if delay time is not run out. When power is supplied, the compressor output will still delay 1 minute to operate.

### 3.2.2 Defrosting :

#### 3.2.2.1 Enable defrosting :

- 3.2.2.1.1 Automatic defrosting : Defrosting enables when compressor operation duration up to dF - dt ; If defrosting is enabled manually, defrost period ( dt ) will not be counted in.
- 3.2.2.1.2 Manual defrost does not affect the counting of defrost cycle ( dF ).
- 3.2.2.1.3 The system starts to count "dt" time after entering defrost mode.
- 3.2.2.1.4 After defrost period has been finished, controller will automatically load defrost cycle "dF" and begins to count down for next defrost period ( dt ).
- 3.2.2.1.5 The system defrosts only once during one defrost cycle.

#### 3.2.2.2 Disable defrosting :

- 3.2.2.2.1 When defrost period ( dt ) up.
- 3.2.2.2.2 Disable defrosting manually will not interfere with defrost cycle.
- 3.2.2.2.3 Error alarming starts.

- 3.2.2.3 Defrosting : After defrosting enabled, the compressor output will be disabled. "dt" time will begin to be counted down to terminated defrosting.

- 3.2.2.4 After reset "dF" or "dt" values, the system will be loading the new values for next defrost cycle.

- 3.2.2.5 Any failure / malfunction occurred will not affect the time counting of defrost cycle.

## 3.2.3 Parameter setup :

- 3.2.3.1 Parameter selection : Press **[▲]** or **[▼]** key to select parameter codes in sequence tS, td, dF, dt, AU, AL, HS, LS, Ad, AC, Cr, CS, Ot, Ut, OU.

- 3.2.3.2 Display or reset parameter values : Press **[Set]** to display parameter values after entering parameter setting mode. Parameter value will be increasing or decreasing by holding **[▲]** or **[▼]** key. Press **[Set]** again to save parameter and return to parameter code display. Select "OU" and then press **[Set]** to exit parameter setting and return to normal operation mode.

- 3.2.3.3 Setup mode would be ended and save parameter values without any key pressed within 15s and return to normal operation mode.

- 3.2.4 Rapid setup : when "tS" value blinks in display, press **[▲]** or **[▼]** key to reset "tS" value, press **[Set]** key again or no keys have been pressed in 5s, the system will save the value and return to normal operation mode.

- 3.2.5 Lock parameter : Parameter can't be reset after being locked, but "tS" can be adjusted. When the display shows "LC", it means parameter has been locked; "UL" means parameter is unlocked.

### 3.2.6 Max. and min. cabinet temperature record:

- 3.2.6.1 When cabinet temperature first time  $\leq$  setpoint ( tS ), the controller begins to record maxi. & min. cabinet temperature.

- 3.2.6.2 Power failure will not harm for cabinet temperature record, after power is supplied, temperature record will be recalled by controller's memory.

- 3.2.7 Parameter memory : If power failure happens, the controller will operate according to previous parameter values after power is supplied again.

- 3.2.8 Restore default values : The display will be showing "tS", the controller reboots in 5s.

- 3.2.9 Temperature calibration ( Ot ) : When there is an aging or inaccuracy occurred on cabinet sensor, users can take this advantage to adjust temperature to a precise temperature.

- 3.2.10 Abnormal temperature alarm : Alarm starts when cabinet temperature exceeds "AU" or drops below "AL".

- 3.2.11 Circuit board protection : Whenever the temperature of circuit board is out of 95°C ( 203°F ), the controller will disable output contacts compulsively, showing "tA" in display and enabling alarms. Once the temperature of circuit board drops below 75°C ( 167°F ), "tA" will be released.

## 3.3 LED indicator :

### 3.3.1 Compressor status LED :

- 3.3.1.1 It keeps dark under setup mode.
- 3.3.1.2 It blinks rapidly under defrost mode.
- 3.3.1.3 It keeps bright when compressor is ON.
- 3.3.1.4 It keeps dark when compressor output is OFF.
- 3.3.1.5 It blinks when compressor's output has yet to reach compressor delay protection time.

## 4. Failure elimination :

### 4.1 Alarm code :

- 4.1.1 "UA" : Cabinet temperature  $\geq$  AU, UA and cabinet temperature display by turns.
- 4.1.2 "LA" : Cabinet temperature  $\leq$  AL, LA and cabinet temperature display by turns.
- 4.1.3 "tA" : Circuit board temperature  $\geq$  95°C ( 203°F ), tA blinks.

### 4.2 Error code : Compressor operates with Cr / CS ( When Cr and CS are 0, compressor continues operating ).

- 4.2.1 "EE" : Parameter error/ failure. To reboot controller, if fails to work normally, send it back to factory for inspection.
- 4.2.2 "E1" : Cabinet sensor failure, please try to check if the sensor is well - connected ( or replace sensor ).
- 4.2.3 "E3" : There is a failure / malfunction occurred in circuit board sensor, send it back to factory for inspection.

## 5. Parameter list :

| Code | Function  | Range      |           | Default    | Unit     | Description   |
|------|---|------------|-----------|------------|----------|---|
|      |   | Min.       | Max.      |            |          |   |
| tS   | setpoint  | LS         | HS        | 4<br>40    | °C<br>°F | Compressor stops when it reaches the setpoint.  |
| td   | Setpoint differential                           | 0.5<br>1   | 10<br>20  | 4<br>8     | °C<br>°F | Compressor will be on when the temp. $\geq$ tS + td.  |
| dF   | Defrost cycle                                   | 0          | 99        | 6          | hr       | Set the interval of defrost period.   |
| dt   | Defrost period                                  | 1          | 55        | 30         | min      | To control defrost time, the system would stop defrosting if defrost time is run out.   |
| AU   | Max. temperature alarm                          | AL+1       | 50<br>131 | 45<br>113  | °C<br>°F | Alarm outputs ( Buzzer ) when room temperature is higher than or equal to the setting value. ( To operate: cabinet temperature needs to be up to setting temperature once ) |
| AL   | Min. temperature alarm                          | -40        | AU-1      | -40        | °C<br>°F | Alarm outputs ( Buzzer ) when room temperature is lower than or equal to the setting value. ( To operate: room temperature needs to be up to setpoint once )                |
| HS   | Max. setpoint                                   | tS         | 45<br>111 | 25<br>79   | °C<br>°F | To limit the max. setpoint.   |
| LS   | Min. setpoint                                   | -40        | tS        | -30<br>-20 | °C<br>°F | To limit the min. setpoint.   |
| Ad   | Alarm delay                                     | 0          | 60        | 15         | min      | Buzzer output delay time when alarming.   |
| AC   | Compressor delay protection                     | 0          | 30        | 1          | min      | Interval of protection time for compressor operation  |
| Cr   | Compressor operation period under any failure   | 0          | 60        | 15         | min      | Compressor operation time when EE or E1 blinks.   |
| CS   | Compressor termination period under any failure | 0          | 60        | 15         | min      | Compressor termination time when EE or E1 blinks.   |
| Ot   | Temperature calibration                         | -12<br>-20 | 12<br>20  | 0<br>0     | °C<br>°F | Cabinet temperature calibration.  |
| Ut   | Unit selection                                  | °C         | °F        | °C         |          | To display temperature unit.  |
| OU   | Exit setting                                    | -          | -         | -          |          | To quit setup mode.   |