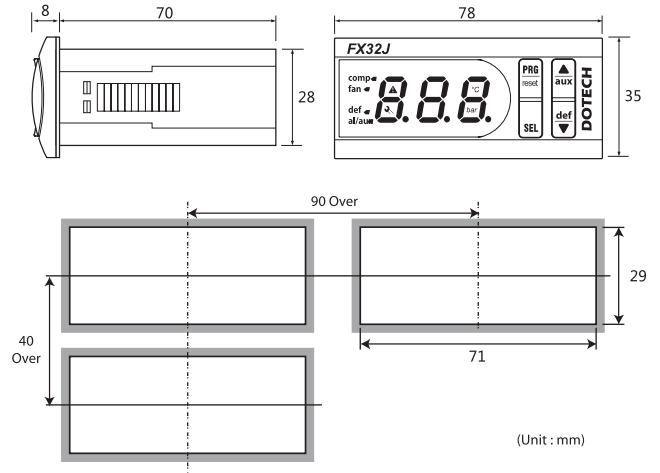


# Show Case, Cold Room Controller (FX32J Series)



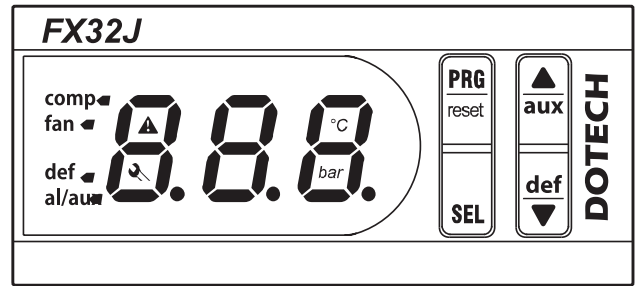
## Dimensions and Panel Cut-Out Form



## PreCaution for Use

1. This product may cause an electric shock in handling. Please do not attempt to open it with power turned on.
  2. This product should be installed in a place fixed secured by a rack or panel.
  3. This product can be used under the following environmental condition  
 ① Indoor ② Pollution Degree 2 ③ At an altitude of 2000m or below ④ Installation Category II
  4. To turn on or turn off power supply for this product, please the circuit breaker or switch of a standard product of IEC 60947-1 or IEC 60947-3 product and install it within a dose distance allowing convenient operation by user.
  5. Please be understood that if this product is dismantled or modified discretionary, after sales service will not be able to be provided.
  6. An output wire to be used for this product should be inflammable grade FV-1 (V-1 grade or above), the thickness of the wire should be AWG No. 20 or above. (0.50mm<sup>2</sup>)
  7. In order to prevent at inductive noise, please maintain the high-voltage wire and power wire separated.
  8. Avoid installing the product in a place where a strong magnetism, noise, severe vibration and impact exist.
  9. When extending the sensor wire, use a shield wire and do not extend it unnecessary long.
  10. The sensor wire and signal wire should be away from the power and load wires using conduits separately installed.
  11. Avoid using the product near a device generating strong high frequency noise (high-frequency welding machine, high-frequency sewing machine, high-frequency radiotelegraph, high capacity SCR controller)
  12. PRODUCT'S DAMAGES OTHER THAN THOSE DESCRIBED IN THE GUARANTEE CONDITIONS PROVIDED BY THE MANUFACTURER SHALL NOT BE RESPONSIBLE BY US.
- ※ The Aforementioned precautions must be observed, and if you fail to do so, it may cause a product's breakdown.

## Constitution (Function of Display Ramp and Button)



## Basic Specification

|                       |  |
|-----------------------|--|
| <b>Model</b>          | FX32J Showcase & Coldroom Controller   |
| <b>Power</b>          | AC100-240V~, 50/60Hz, 4VA  |
| <b>Connector</b>      | Screw bolt terminals (1.5mm <sup>2</sup> Wire Use Possibility)   |
| <b>Input / Output</b> | Relay output 4p (COMP, DEF : 10A, 250VAC/FAN, AUX : 5A, 250VAC)<br>Temp. sensor input 2p                           |
| <b>Operation</b>      | Temp. : -10~50°C, Humidity : Under 90%RH   |
| <b>Storage</b>        | Temp. : -20~60°C, Humidity : Under 90%RH   |
| <b>Sensor</b>         | Temp. Sensor: DOTECH Standard NTC sensor DPR-TH1-ET<br>5kΩ at 25°C, Range : -50 ~ 105°C, Accuracy : ±0.3°C at 25°C |

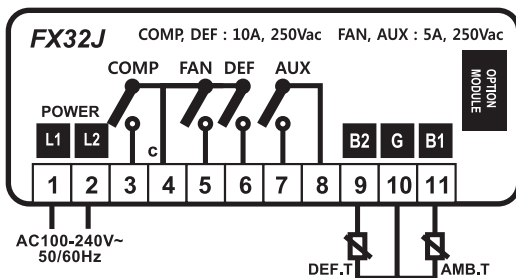
|               |  |
|---------------|--|
| <b>comp</b>   | - ON at comp.(SOL) operation.<br>- Flickering during initial start delay, re-running delay and min. run delay. |
| <b>fan</b>    | - ON at fan control output<br>- Flickering at run delay and stop delay   |
| <b>def</b>    | ON at defrost control output   |
| <b>al/aux</b> | ON at alarm/aux. control output on   |
| <b>°C</b>     | ON at temp. display  |
| <b>!</b>      | ON at trip   |

## Order Information

- FX32J - 00 : Basic Model
- FX32J - A1 : Add 4~20mA Transmission Output (Connection cable is provided basically)
- FX32J - R4 : RS485 Communication(Modbus RTU/ASCII)(Comm. cable is provided basically)
- FX32J - L1 : Recording Printer Applicable Model
- FX32J - L2 : Data Rogger Applicable Model
- FXP - 60 : Exclusive Recording Printer for FX32J-L1 (Adaptor & Cable are provided basically)

※ A temp. sensor (DPR-TH1-ET) is standard scope of supply for FX32J.  
It is possible to purchase additional sensor, if you need.

## Connection Diagram



B1 : AMB,T      N1 : COMP      N3 : DEF  
B2 : DEF,T(AUX,T)      N2 : FAN      N4 : ALARM

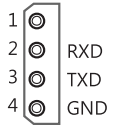
|                             |   |  |  |
|-----------------------------|---|--|--|
| <b>PRG reset</b>            | - Program setup (Push for 5sec.)<br>- Alarm reset (Push 2 times quickly & successively) | <b>aux</b>   | - Moving between menus<br>- Increasing setup value |
| <b>SEL</b>                  | - Execution for selected menu<br>- Input of setup value                                 | <b>def</b>   | - Moving between menus<br>- Decreasing setup value |
| <b>PRG reset</b> <b>SEL</b> | <b>Confirm setup temp. and time</b>   | If pushing for 1sec., it shows setup temp. for 2 sec. and then current time for 6 sec. (It is applicable for L1, L2 model to confirm current time only)          |  |
| <b>aux</b> <b>def</b>       | <b>Confirm temp. sensor</b>   | If pushing for 1 sec., it displays B1 temp. ▶ B2 temp. ▶ Current state<br>B1 : Comp LED flickering<br>B2 : Fan LED flickering                                    |  |
| <b>aux</b>                  | <b>Confirm aux. output function</b>   | If pushing for 2 sec., it confirms aux. output function<br>AL O : Using as alarm output<br>EF O : Using as defrost sync. output<br>Ht O : Using as heater output |  |
| <b>PRG reset</b> <b>aux</b> | <b>Initialize setup value</b>   | If pushing for 2 sec. with power input, setup value is initialized.  |  |
| <b>def</b>                  | <b>Forced defrost mode</b>  | Forced defrost mode entry by pushing for 3 sec.<br>Forced defrost mode reset by pushing for 3 sec.   |  |
| <b>SEL</b> <b>def</b>       | <b>Cleaning mode</b>  | Cleaning mode entry by pushing for 5 sec. at the same time<br>Cleaning mode reset by pushing for 5 sec. at the same time   |  |

## Option Module

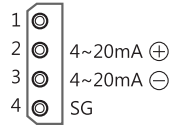
**FX32J-R4**  
RS-485 COMM.  
OPTION MODULE



**FX32J-L1, -L2**  
RS-232 COMM.  
OPTION MODULE



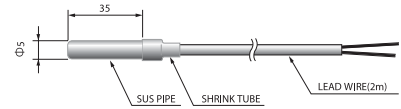
**FX32J-A1**  
4~20mA Output  
OPTION MODULE



## FX32J Temp. Sensor

**Exclusive Temp. Sensor : DPR-TH1-ET**

Sensor type : NTC 5KΩ  
Range : -50 ~ 105°C  
Accuracy : ±0.3°C at 25°C  
Sheath : Φ4 X 40mm, SUS  
Cable : 2C X 0.5mm

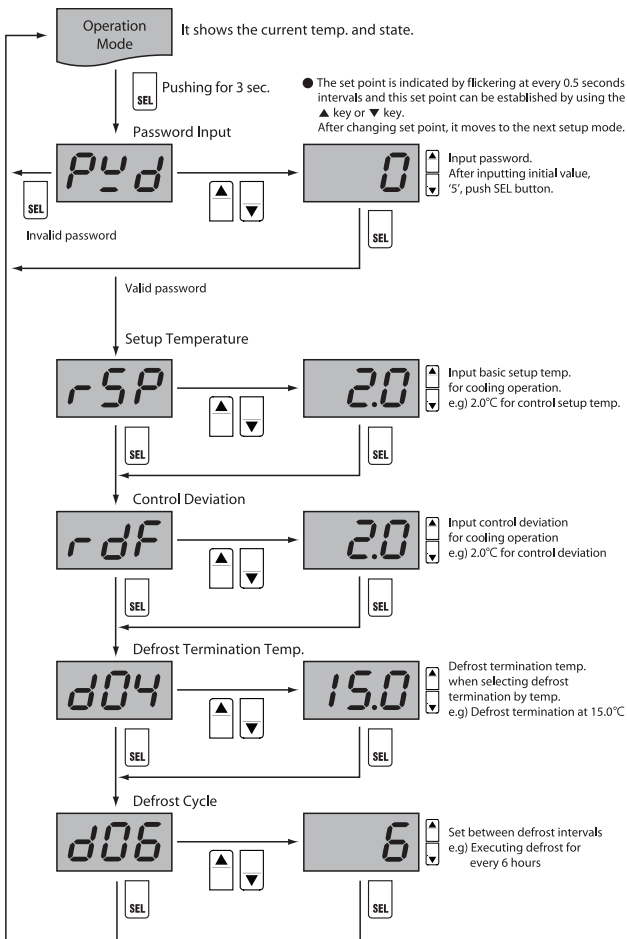


## FXP-60 Recording Printer (FX32J-L1 Applicable for FX32J-L1)



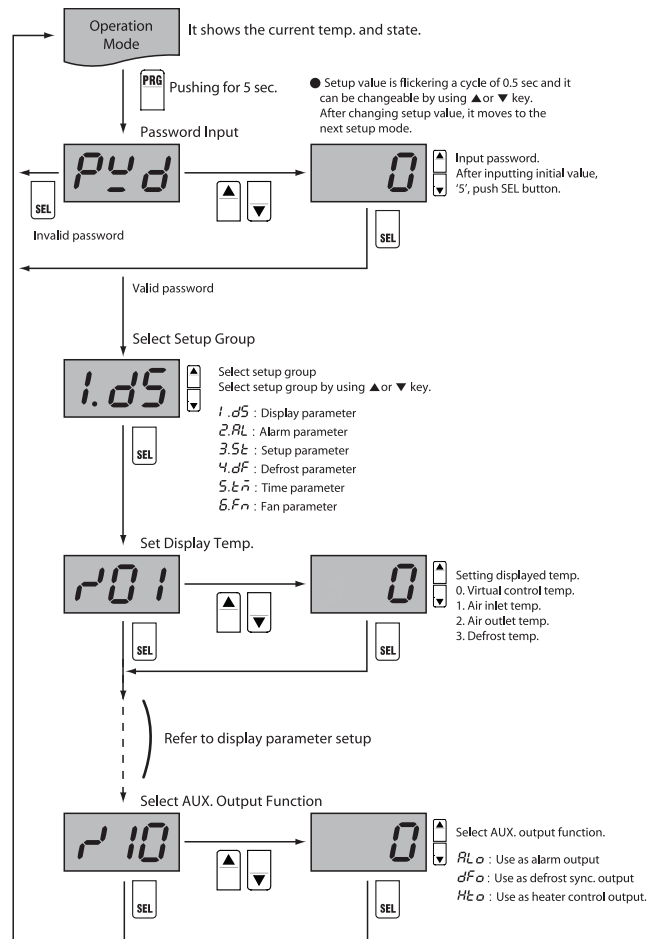
|                     |  |
|---------------------|--|
| Characters Per Line | 42cpl(MAX)   |
| Character Size      | Eng : 9x24 dots<br>Kor : 16x24 dots(24x24dots)   |
| Optional Characters | Chinese, Arabic, Cyrillic, Russian, Turkish, Greek, Japanese, Persian Latin9 and Others upon request |
| Resolution          | 203dpi, 8dots/mm   |
| Print Width         | 2-Inch(48mm, 384dots)  |
| Print Speed         | 50mm/Sec   |
| Dimension           | 76x93x62mm   |
| Panel Cut Size      | 93.4 x 76.4mm  |
| Weight              | 274g   |
| Interface           | RS232  |
| Paper supplied      | Thermal roll paper   |
| Input Power         | 9VDC, Standby 60mA and Max 3A  |

## Quick Setup (Required temp., Control deviation, Defrost termination temp., Defrost cycle)



● If there's no input made for a period of 180 seconds during the setting, then it returns back to the run mode automatically.

## Changing and Confirming All Data At Once



● If there's no input made for a period of 180 seconds during the setting, then it returns back to the run mode automatically.

## 1.d5 Display parameter

| ITEM | CODE | DESCRIPTION                           | MIN   | MAX   | DEFAULT | UNIT  | DETAIL ESTABLISHMENT   |
|------|------|---------------------------------------|-------|-------|---------|-------|--|
| 101  | r01  | Display temp select                   | 0     | 2     | 0       | -     | 0: Virtual control temp. 1: Air inlet temp. 2: Defrost temp.(Air outlet temp.)   |
| 102  | r02  | Alarm display                         | -     | -     | YES     | -     | no: Not displayed, YES: Displayed  |
| 103  | r03  | Decimal point display setup           | -     | -     | 0.1     | -     | 0.1: Decimal point displayed, 1: Decimal point not displayed   |
| 104  | r04  | Defrost display                       | 0     | 2     | 0       | -     | 0: dF 1: dF+Defrost sensor temp. 2: dF+controlled temp.  |
| 105  | r05  | Password                              | 0     | 999   | 5       | -     | Password   |
| 107  | r07  | AMB(Inlet) Temp offset                | -19.9 | +19.9 | 0.0     | 0.1°C | Input temp. offset value for inlet sensor  |
| 108  | r08  | DEF Temp offset                       | -19.9 | +19.9 | 0.0     | 0.1°C | Input defrost temp. offset for defrost (air outlet) sensor   |
| 110  | r10  | Auxiliary Output select               | -     | -     | ALo     | -     | Select AUX. output function<br>ALo: Use as alarm output<br>dFo: Use as defrost sync. output<br>HEo: Use as heater output |
| 113  | r13  | Max. transmission output range (20mA) | -50   | 105   | 50      | °C    | Input max. range value of 20mA output in transmission output function.   |
| 114  | r14  | Min. transmission output range (4mA)  | -50   | 105   | -50     | °C    | Input min. range value of 4mA output in transmission output function.  |

※ Trans. output function is applicable for A1 model only.

## 2.AL Alarm parameter

| ITEM | CODE | DESCRIPTION                          | MIN | MAX  | DEFAULT | UNIT | DETAIL ESTABLISHMENT  |
|------|------|--------------------------------------|-----|------|---------|------|---|
| 201  | AL01 | High Temp. Alarm                     | 0   | 50.0 | 5.0     | 0.1K | High temp. alarm setup value. (In case of setting "no" and 5.0°C higher than setup temp., no alarm occurred)  |
| 202  | AL02 | Low Temp. Alarm                      | 0   | 50.0 | 3.0     | 0.1K | Low temp. alarm setup value. (In case of setting as "no" and 3.0°C lower than setup temp., no alarm occurred) |
| 203  | AL03 | High Temp. Alarm delay after defrost | 1   | 240  | 50      | min  | Delay time for alarm sensing after defrost termination (No use at OFF)  |
| 204  | AL04 | High Temp. Alarm delay               | 1   | 240  | 50      | min  | Delay time for alarm occurring in case of over high temp. alarm setup value (No use at OFF)                   |
| 205  | AL05 | Low Temp. Alarm delay                | 1   | 240  | 50      | min  | Delay time for alarm occurring in case of below low temp. alarm setup value (No use at OFF)                   |

## 3.5t Setup parameter

| ITEM | CODE   | DESCRIPTION                      | MIN   | MAX  | DEFAULT | UNIT  | DETAIL ESTABLISHMENT   |      |                           |                                  |   |  |                                |   |                                |                        |
|------|--|----------------------------------|-------|------|---------|-------|--|------|---------------------------|----------------------------------|---|--|--------------------------------|---|--------------------------------|------------------------|
| 301  | r01  | Temp. Control Mode               | 0     | 2    | 1       | -     | 0: No temp. control, Continuous cooling<br>1: Cooling, dead-band control (Stop: setup value, Run: setup value + deviation)<br>2: Cooling, modulating control (Stop, Run: setup value±deviation/2)  |      |                           |                                  |   |  |                                |   |                                |                        |
| 302  | r02  | Sensor use Mode                  | 1     | 2    | 2       | -     | <table border="1"> <thead> <tr> <th>Sec.</th> <th>Air inlet (B1 - AMB TEMP)</th> <th>Defrost recovery (B2 - DEF TEMP)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Use(When Eb2 occurred, combined use for defrost automatically)</td> <td>Use (Combined use for control)</td> </tr> <tr> <td>1</td> <td>Use (Combined use for defrost)</td> <td>Not use (Eb2 Alarm: X)</td> </tr> </tbody> </table> <p>Eb1: Air inlet temp. sensor error, Eb2: Defrost recovery sensor error</p> | Sec. | Air inlet (B1 - AMB TEMP) | Defrost recovery (B2 - DEF TEMP) | 2 | Use(When Eb2 occurred, combined use for defrost automatically) | Use (Combined use for control) | 1 | Use (Combined use for defrost) | Not use (Eb2 Alarm: X) |
| Sec. | Air inlet (B1 - AMB TEMP)                                      | Defrost recovery (B2 - DEF TEMP) |       |      |         |       |  |      |                           |                                  |   |  |                                |   |                                |                        |
| 2    | Use(When Eb2 occurred, combined use for defrost automatically) | Use (Combined use for control)   |       |      |         |       |  |      |                           |                                  |   |  |                                |   |                                |                        |
| 1    | Use (Combined use for defrost)                                 | Not use (Eb2 Alarm: X)           |       |      |         |       |  |      |                           |                                  |   |  |                                |   |                                |                        |
| 303  | r03  | Set point range Min.             | -50.0 | r04  | -40.0   | 0.1°C | Min. settable value for rSP (Range Set Point)  |      |                           |                                  |   |  |                                |   |                                |                        |
| 304  | r04  | Set point range Max.             | r03   | 70.0 | 30.0    | 0.1°C | Max. settable value for rSP (Range Set Point)  |      |                           |                                  |   |  |                                |   |                                |                        |
| 305  | r05  | Injection Time                   | 0     | 240  | 0       | min.  | If cooling is lasted for setting time, cooling is stopped as long as pump. down time and "Lo" alarm is occurred  |      |                           |                                  |   |  |                                |   |                                |                        |
| 306  | r06  | Night Time Mode ※1               | 0     | 2    | 0       | -     | 0:Not use for night operation, 1:Use for night operation(by setting time), 2:Use for night operation(by ID5 contact)   |      |                           |                                  |   |  |                                |   |                                |                        |
| 307  | r07  | Control Temp Ratio               | 0     | 100  | 0       | %     | Virtual temp. value ratio for outlet (100%) and inlet (0%) sensor  |      |                           |                                  |   |  |                                |   |                                |                        |
| 308  | r08  | Set point offset Night Run ※1    | -10.0 | 50.0 | 2.0     | 0.1K  | Delta setup value applied for night operation (SP = rSP + r08)   |      |                           |                                  |   |  |                                |   |                                |                        |
| 309  | r09  | Difference Value Night Run ※1    | 0.1   | 20.0 | 3.0     | 0.1K  | Operation range applied for night operation  |      |                           |                                  |   |  |                                |   |                                |                        |
| 310  | rSP  | Set point                        | r03   | r04  | 2.0     | 0.1°C | Standard setup value for cooling operation   |      |                           |                                  |   |  |                                |   |                                |                        |
| 311  | r dF   | Difference Value                 | 0.1   | 20.0 | 2.0     | 0.1K  | Control deviation for cooling operation  |      |                           |                                  |   |  |                                |   |                                |                        |
| 312  | HSP  | Set point offset Heat Run        | -50.0 | 70.0 | 2.0     | 0.1°C | Standard setup value for heating operation (Not affected by delta value of night operation)  |      |                           |                                  |   |  |                                |   |                                |                        |
| 313  | H dF   | Difference Value Heat Run        | 0.1   | 20.0 | 2.0     | 0.1K  | Control deviation for heating operation (Not affected by operation deviation of night operation)   |      |                           |                                  |   |  |                                |   |                                |                        |

※ Night operation is applicable for L1, L2 model only.

## 4.dF Defrost parameter

| ITEM | CODE | DESCRIPTION                | MIN   | MAX  | DEFAULT | UNIT  | DETAIL ESTABLISHMENT   |
|------|------|----------------------------|-------|------|---------|-------|--|
| 400  | d00  | Defrost Terminate Mode     | 1     | 4    | 2       | -     | Stop by defrost time, No alarm occurred<br>Stop by whichever occurred first between defrost termination time and max. defrost time, No alarm occurred<br>Stop in terms of satisfaction with both defrost termination time and max. defrost time, No alarm occurred<br>Stop by whichever occurred first between defrost termination temp. and max. defrost time<br>(In case of 2 successive defrost stop by defrost time, EdE alarm occurred) |
| 402  | d02  | Pump Down Time             | 0     | 240  | 1       | min.  | Refrigerant pump down time inside of cooler pipe, before defrost output operating.   |
| 403  | d03  | Drain Time                 | 0     | 240  | 2       | min.  | Moisture draining time after defrost<br>(It is time to drain remained moisture after termination of defrost process and comp. is operating after termination of delay time)  |
| 404  | d04  | Defrost Terminate Temp     | -40.0 | 90.0 | 15.0    | 0.1°C | Termination temp. when choosing termination by temp.   |
| 405  | d05  | Defrost Time Schedule Mode | 0     | 1    | 0       | -     | 0: [d06:Defrost cycle]Cycle by setting 1: Real time defrost  |
| 406  | d06  | Defrost Interval Time      | 1     | 192  | 6       | hr    | Interval time between defrost (No use at OFF)s   |
| 407  | d07  | Defrost Time Max.          | d08   | 240  | 30      | min.  | Max. operation time for real defrost output operation  |
| 408  | d08  | Defrost Time Min.          | 0     | d07  | 0       | min.  | Min. operation time for real defrost output operation  |

## 5.5. Time parameter(Applicable for -L1, -L2 Model Only)

| ITEM | CODE | DESCRIPTION              | MIN | MAX  | DEFAULT    | UNIT    | DETAIL ESTABLISHMENT   |
|------|------|--------------------------|-----|------|------------|---------|--|
| 500  | H00  | Current Time Hour set    | 0   | 23   | curr. hr   | hr      | At the initial stage, it shows the current hour. It is manually settable by pushing UP/DN key.   |
| 501  | H01  | Current Time Min. set    | 0   | 59   | curr. min. | min.    | At the initial stage, it shows the current minute. It is manually settable by pushing UP/DN key.   |
| 502  | H02  | Night setback Time Start | 0.0 | 23.5 | 0.0        | 10 min. | It is followed by 24-hour display.<br>10 digit : It is showing hour<br>Down to decimal place : It is showing minute.<br>e.g.) 9:2 ▶ 9:20 am<br>14:3 ▶ 2:30 pm<br>00:0 ▶ 0:00 am<br>00:3 ▶ 0:30 am<br>n.o ▶ No display for defrost (Input on remote is '-1'). |
| 503  | H03  | Night setback Time End   | 0.0 | 23.5 | 8.0        | 10 min. |  |
| 505  | H01  | Defrost Time 1st Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 506  | H02  | Defrost Time 2nd Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 507  | H03  | Defrost Time 3th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 508  | H04  | Defrost Time 4th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 509  | H05  | Defrost Time 5th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 510  | H06  | Defrost Time 6th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 511  | H07  | Defrost Time 7th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |
| 512  | H08  | Defrost Time 8th Time    | 0.0 | 23.5 | n.o        | 10 min. |  |

## 5.6. Fan parameter

| ITEM | CODE | DESCRIPTION                         | MIN              | MAX  | DEFAULT | UNIT  | DETAIL ESTABLISHMENT  |
|------|------|-------------------------------------|------------------|------|---------|-------|---|
| 600  | F00  | Fan Run mode at Clean Process       | -                | -    | OFF     | -     | OFF : Stop, ON : Run  |
| 601  | F01  | Fan Run Mode at Cool stop state     | 0                | 2    | 1       | -     | 0 : Stop, 1 : Run, 2 : [F02:Fan stop delay time]stop after delay  |
| 602  | F02  | Fan stop delay time                 | 0                | 600  | 0       | Sec.  | In case of [F01 : Fan run when cooling stop] = 2, stop delay time   |
| 603  | F03  | Fan Run Mode at Defrost state       | -                | -    | OFF     | -     | OFF : Stop(Defrost for heat source), ON : Run(Natural defrost)  |
| 604  | F04  | Fan Run Delay at Defrost Terminated | 0                | 2    | 0       | -     | 0 : Run at once, 1 : Run after [Fan run delay after defrost], 2 : Run after achieving [Fan run temp. after defrost]   |
| 605  | F05  | Fan Run Delay at Defrost Terminated | 0                | 600  | 0       | Sec.  | In case of [F04 : Fan run mode after defrost]=1(Run delay), Fan delay time  |
| 606  | F06  | Fan Run Temp at Defrost Terminated  | -40.0            | 50.0 | 0.0     | 0.1°C | In case of [F04 : Fan run mode after defrost]=2(Run temp), Fan run temp.  |
| 610  | E10  | Comp. initial start delay time      | 0                | 600  | 10      | Sec.  | It prevents comp. from shortening its lifetime due to overload that a comp. is shut down with full pressure load by power failure and restart with the same load.   |
| 611  | E11  | Comp. restart delay time            | 0                | 600  | 30      | Sec.  | It prevents comp. from restarting from comp. OFF to restart delay time to avoid frequent ON/OFF.<br>* Although current temp. is higher than control sensitiveness range, output of comp. keeps OFF state and comp. is ON after termination of restart delay time. |
| 612  | E12  | Comp. min. operation time           | 0                | 300  | 10      | Sec.  | It sets min. operation time to avoid frequent ON/OFF.<br>* Although current temp. is lower than control sensitiveness range, output of comp. keeps ON state and comp. is OFF after termination of min. operation time.  |
| 613  | Id   | Communication ID                    | 1                | 128  | 1       | -     | Setting communication address : 1station ~ 32station  |
| 614  | bPS  | Communication Baudrate              | 48, 96, 192, 384 |      | 96      | -     | 48 : 4800BPS, 96 : 9600BPS, 192 : 19200BPS, 384 : 38400BPS  |

※ Comm. function menu is applicable for L1, -L2, and -R4 model only.

## 5.7. TRIP / ALARM MESSAGE

| ITEM | CODE | DESCRIPTION                              | DETAIL ESTABLISHMENT   | OPERATION WHEN SENSING     | RESET     |
|------|------|--|--|----------------------------|-----------|
| 1    | SYS  | Internal control variable error          | Occurrence : When internal important control variable has been changed due to external strong magnetic or noise.<br>Reset : Resetting variable value and reboot          | Stop at once               | Automatic |
| 2    | EHH  | Higt temp. alarm                         |  |                            | Automatic |
| 3    | ELL  | Low temp. alarm                          |  |                            | Automatic |
| 6    | Edt  | Defrost termination (frost piling) alarm |  | -                          | Automatic |
| 9    | Eb1  | Air inlet temp. sensor error             |  | -                          | Automatic |
| 10   | Eb2  | Defrost recovery sensor error            |  | -                          | Automatic |
| 12   | REC  | Emergency cooling operation              | When all control sensors' error  | Emergency normal operation | Manual    |
| 13   | ELt  | High temp. range operating after defrost |  | -                          | Automatic |
| 15   | ECL  | Internal real time timer stop alarm      | Detecting only when real time defrost. If internal real time timer is stopped, it is automatically transferred to regular cycle defrost type.                            | -                          | Automatic |
| 16   | Lo   | Injection time excess alarm              | If cooling operation is continued during injection time and then exceeded, it is OFF for pump down time. In this case, it shows message, but doesn't occur alarm output. | -                          | Automatic |

## 5.8. STATE MESSAGE

|   |     |  |   |  |  |
|---|-----|--|---|--|--|
| 1 | ELn | Cleaning mode operation state          |   |  |  |
| 2 | SoF | Manual comp. (SOL.) output stop        | Possible to remote control              |  |  |
| 3 | FoF | Manual cooling fan output stop         | Possible to remote control              |  |  |
| 4 | Lo  | Injection cooling operation state      | Solenoid valve temporary emergency stop |  |  |
| 5 | dPd | Pump down state display before defrost | Comp.(SOL.) OFF, Defrost output OFF     |  |  |
| 6 | ddr | Drain time state display after defrost | Comp.(SOL.) OFF, Defrost output OFF     |  |  |
| 7 | dF  | Defrost state display                  | Comp.(SOL.) OFF, Defrost output ON      |  |  |

※ Please push PRG button in 2 successive time if you want to reset manually in terms of meeting reset condition. (It is also applicable to reset the power)