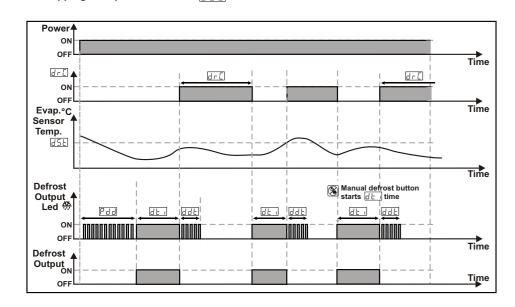
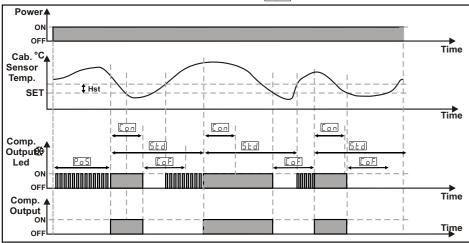
# 6.3 Operation Graphics of ESM-3712-CN Cooling Controller

1-Defrost time parameter value dt 1, Defrost repeat cycle parameter value dr [ 1, Defrost at power on selection and defrost delay parameter value  $P \triangleleft d$  1, Dripping time parameter value ☐ ☐ と 1 ise;



2- Compressor start delay at power on parameter value Po5 1, Compressor start - start delay parameter value 5 2 1
Minimum compressor OFF time parameter value 5 5 Minimum compressor ON time parameter value



### 7. Failure Messages in ESM-3712-CN Cooling Controller

2-5 h 2 message blinking.

Evaporator temperature sensor failure. sensor connection is wrong or there is no sensor connection. 3- R! message blinking

4- RH message blinking.

For absolute alarm, if cabinet temperature sensor value is higher than temperature alarm maximum parameter  $\frac{H \cup H}{U}$  value and for relative alarm, if cabinet temperature sensor value is higher than (Temperature Set  $+ \boxed{\square \square \square}$ ), then  $\boxed{\square \square \square}$  message starts to blink. If buzzer function selection parameter  $\boxed{\square \square \square}$  is 2 or 4, internal buzzer starts to operate.

5- | A d | message blinking.

When the digital input is active and digital input function selection parameter value  $d F \cap d = 0$  is 0 or 2 message starts to blink.

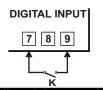
6- R In message blinking.

When the digital input is active and digital input function selection parameter value 6 F n is 1 or 4 message starts to blink. If buzzer function selection parameter buF is 2 or 4, internal buzzer arts to operate



→3 sn. protection parameter value PrE = 0 or 2 and defrost output is inactive, in main operation screen if defrost button is pressed for 3 seconds manual defrost will be active

### 8.1 Manual Defrost Operation with Digital Input



While digital input function selection parameter value dF = 3if digital input contact selection parameter value dEE=1 (normally open NO) and the K switch is getting closed, or if digital input contact selection parameter value dEE =2 (normally close NC) and the K switch is getting opened manual defrost will be active

## 9.Modbus Adresses of Device Status Parameters (Read Input Register)

MODBUS ADRES:30001 Cabinet Temperature Value

MODBUS ADRES:30002 Evaporator Temperature Value MODBUS ADRES:30003 Led Status 0.bit °C Led, 4.bit Fan Led, 5.bit Defrost Led,

6.bit Compressor Led, 7.bit Alarm Led

13.bit Programming Led, 14.bit Set Led 0.bit Alarm Status, 1.bit Buzer Status MODBUS ADRES:30004 Device Status:

2 bit Cabinet Sensor Lost Status 3.bit Evaporator Sensor Lost Status

7.bit Defrost Status

MODBUS ADRES:30005 Output Status : 0.bit Compressor Output 1.bit Defrost Output

2.bit Fan Output

### MODBUS ADRES:30006 Device Type and Version

### 10. Specifications

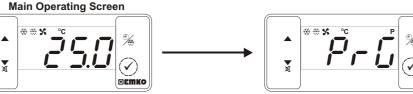
**Device Type** 

: 76 mm x 34.5 mm x71 mm plastic housing for panel Housing&Mounting

Panel cut-out is 71 x 29 mm

: NEMA 4X (IP65 at front, IP20 at rear) **Protection Class** 

6.4 Entering To The Programming Mode, Changing and Saving Parameter



accessing password

When SET button is pressed for 5 seconds, "P" led starts to blink. If programming mode entering password is different from 0.

Pr [] will be observed.

Note1: If programming mode accessing password is observed instead of programming mode entering screen

**Programming Mode** Entering Screen

is 0, hysteresis screen H5E Press SET button for accessing to the programming screen Pr [] password entering screen.

Press SET/OK hutton for

entering the password.

**Password Entering Screen Password Entering Screen** 

Note-2: If programming mode accessing password is 0 parameter values can be seen.But parameter values can not be changed.

**Programming Screen** H5E

Press SET button for accessing to the parameter value. Press increment button for accessing to the next parameter, press decrement button for accessing to the previous parameter

Enter programming mode accessing

password with increment and decrement



Hysteresis Parameter Value Press set button for saving

the parameter

Compressor Output

Compressor Output

Hysteresis Parameter Value

Change the value with increment

and decrement buttons.

Hysteresis Parameter Press increment button for accessing to the next parameter, press decrement button for accessing to the previous parameter

: Standard, indoor at an altitude of less than 2000 meters

: II, office or workplace, none conductive pollution

: NTC (10 k @25 °C ) or PTC (1000 @25 °C )

: S (Green), P (Green), °C (Yellow), °F(Yellow),

: 16(8) A@250 V ~ at resistive load(Compressor Output)

Alarm(Red), Defrost Output (Red), Fan Output (Red)

convert it to the ordering codes.

 $\sim$ 

===

www.emkoelektronik.com.t

5 A@250 V ~ at resistive load(Defrost and Fan Output)

All order information of ESM-3712-CN Cooling

Controller are given on the table at left. User may

form appropriate device configuration from

information and codes that at the table and

specifications must be determined. Please fill the

Please contact us, if your needs are out of the

Note-1:If input type is selected PTC or NTC

(BC= 12, 18), Temperature sensor is given

with the device. For this reason, if input type is

selected as PTC, sensor type (V = 0.1 or 2) or if

input type is selected as NTC, sensor type (V

=0,3 or 4) must be declared in ordering

Vac.

 $\Delta \approx Vdc$  or Vac can be applied

Vdc

order code blanks according to your needs.

Firstly, supply voltage then other

**Environmental Ratings** 

Overvoltage Category

**Operating Conditions** 

**Supply Voltage and Power** 

**Temperature Sensor Inputs** 

**Sensor Break Protection** 

11.Ordering Information

4 115V~ (±%15) 50/60Hz - 1.5VA 5 230V~ (±%15) 50/60Hz - 1.5VA

01 Relay Output ( 5 A@250 V  $\sim$  at resistive load, 1 NO ) HI Fan Output

Relay Output ( 5 A@250 V ~ at resistive load, 1 NO )

V Temp. Sensor which is given with ESM-3712-CN

PTCS-M6L30.K1.5.1/8" (PTC Liquid Probe with1.5 mt silicon cable)
NTC-M5L20.K1.5 (NTC Sensor, thermoplastic moulded with

1.5 m cable for cooling application

PTC-M6L40.K1.5 (PTC Air Probe with 1.5 mt silicon cable)

1.5 m cable for cooling application)

NTC-M6L50.K1.5 (NTC Sensor, stainless steel housing was considered in the constant of th

NTC Input Type or PTC Input Type

**Pollution Degree** 

Installation

Accuracy

Display

LED

**Sampling Cycle** 

**Relay Outputs** 

Internal Buzzer

BC Input Type
12 PTC (Note-1

TC (Note-1)

FG Defrost Output

Approvals

Storage / Operating Temperature

Storage / Operating Humidity

If no operation is performed in programming mode for 20 seconds, device turns to main operation screen automatically.

### 7. Failure Messages in ESM-3712-CN Cooling Controller

1- 5 b 1 message blinking. Cabinet temperature sensor failure. Sensor connection is wrong or there is no sensor connection. While this message shown on this display, if buzzer function selection parameter  $[\underline{b} \, \underline{\cup} \, F]$  is 3 or 4, internal buzzer starts to operate.

Approximately 0.2 Kg

: Fixed installation

: 10-30V=== 1.5W

: 3 samples per second

: 14 mm Red 4 digit LED Display

standards

information.

Thank you very much for your preference to use Emko Elektronik products, please visit our Your Technology Partner web page to download detailed user manual.

Compressor Ouput (Red),

: NTC or PTC

: Upscale

: ON / OFF

83dB

A BC D E / FG HI / U V W Z

0 / / 1 0 0

: GOST-R,CE

: Continuous

with none condensing humidity

: -40 °C to +85 °C / 0 °C to +50 °C

: 90 % max. (None condensing)

: 230V~ ( ±%15) 50/60Hz - 1.5VA

: 115V $\sim$  ( ±%15) 50/60Hz - 1.5VA

: ±1 % of full scale for thermoresistance

**BEMKO** Controlle Cooling

Size

77x35

Ö

ESM-3712-

**( E** ESM-3712-CN 77 x 35 DIN Size Digital . ON / OFF Cooling Controller - 4 Digits Display
- NTC Input or PTC Input (Must be determined in order.) - 3 output for compressor, defrost and fan controls - 2 sensor input for cabinet and evaporator - Configurable digital input - ON / OFF Control

- Set value boundaries

- Operation selection of compressor operate continuously, stops or operates periodically in case of cabinet probe defect

- Separately adjustable 2 offset value for cabinet and evaporator

BEMKO

- Compressor protection delays

- Selectable defrost function (hot gas or electric ) - Adjustable defrost time from front panel

- Manual defrost from front panel

- Defrost parameters - Alarm parameters

- Fan can be operated depending on compressor and defrost

- Fan can be operated depending on evaporator temperature or (cabinet - evaporator ) temperature

- Adjustable internal buzzer according to the defrost, cabinet prob defect and alarm status

- Defrost time and/or manual defrost and/or temperature set value

- Password protection for programming mode

- Installing parameters using Prokey

- Remote access, data collecting and controlling with Modbus RTU

Having CE mark according to European Norms

Instruction Manual. ENG ESM-3712-CN 02 V02 09/12

A visual inspection of this product for possible damage occurred during shipment is recommended It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.

The unit is normally supplied without a power supply switch or a fuse. Use power switch and fuse as

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can

Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.

Do not use the unit in combustible or explosive gaseous atmospheres.

During putting equipment in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage of the product on a system must be done with it's fixing clamps. Do not do the montage of the device with inappropriate fixing clamp. Be sure that device will not fall while doing the montage.

It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

### 1.4 Warranty

tronik warrants that the equipment delivered is free from defects in ma document and instruction manual performs by the customer completely

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.

Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case

### 1.6 Manufacturer Company

Manufacturer Information

Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA/TURKEY

: +90 224 261 1912

Emko Elektronik Sanayi ve Ticaret A.Ş.

Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369 BURSA/TURKEY Phone: +90 224 261 1900

: +90 224 261 1912

### 1.Preface

ESM-3712-CN series cooling controllers are designed for controlling cooling process. They can be used in many applications with their easy-use, On / Off control form and defrost properties. Some application and application fields which they are used are below

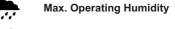
etc..

: 90% Rh (non-condensing)

**Application Fields Applications** Refrigerators Machine production industries Air Conditioning Storages Freezers

### 1.1 Environmental Ratings



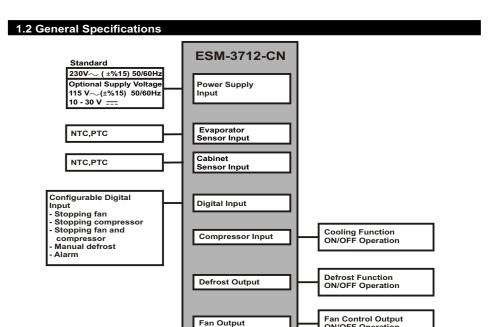


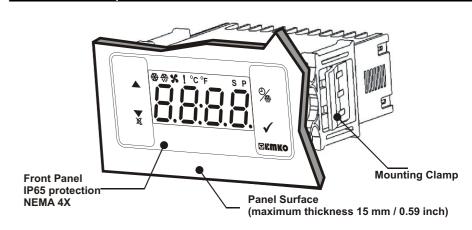
: Up to 2000 m.



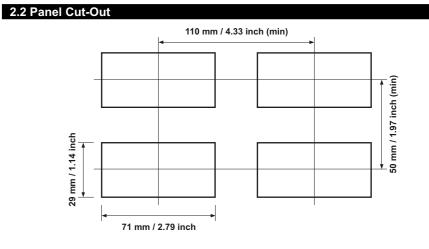
Forbidden Conditions: Corrosive atmosphere

**Explosive atmosphere** Home applications (The unit is only for industrial applications)





## 2.1 Front View and Dimensions of ESM-3712-CN Cooling Controller Maximum 15 mm / 0.59 inch **BEWKO** 65 mm / 2.56 inch 76 mm / 3 inch 6 mm / 0.24 inch

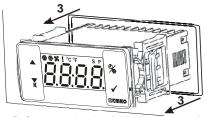


workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty

Emko Elektronik Sanayi ve Ticaret A.Ş.

Repair and maintenance service information:





1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

2-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

3- Insert the mounting clamps to the fixing sockets that located left and right sides of device and make the unit completely immobile within the



Before starting to remove the unit \ from panel, power off the unit and  $\stackrel{\bullet}{\longrightarrow}$  the related system.

2-Pull the unit through the front side of the

### 3. Optinal Accessories

### 1.RS-485 Module



RS-485 Communication Interface

2.PROKEY Programming Module



The device is programmed (Upload or Download) by using the parameters.

### 3.1 Using Prokey

BUTTON TO TURN BACK TO MAIN OPERATION SCREEN.

### DOWNLOADING FROM DEVICE TO PROKEY

**1.**The device is programmed by using parameters.

2.Energize the device then put in PROKEY and press ▼ button. LPL Message is shown on the display. When the loading has finished, End message is shown.

3. Press any button to turn back to main operation screen.

**4.**Remove the PROKEY.

NOTE: Erg message is shown when an error occurs while programming. If you want to reload, put in PROKEY and press ▼ button. If you want to quit, remove PROKEY and press ▼ button. The device will turn back to main operation screen.

### DOWNLOADING FROM PROKEY TO DEVICE

1.Switch off the device.

2.Put in PROKEY then energize the device.

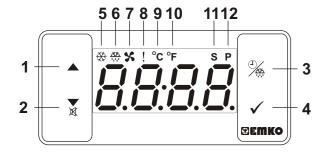
3. When the device is energized, the parameter values in PROKEY, start downloading to the device automatically. At first, 🖟 🗓 🗓 message is shown on the display, when loading has finished, 📙 🗖 message is shown

4.After 10 second device starts to operate with new parameter values.

5.Remove the PROKEY.

NOTE: [ F r ] message is shown when an error occurs while programming. If you want to reload, switch off the device and put in PROKEY then energize the device. If you want to quit remove PROKEY and press ▼button. The device will turn back to main operation screen

### 5. Front Panel Definition and Accessing to the Menus



### **BUTTON DEFINITIONS**

1. Increment Button:

\* In main operation screen, press this button to display evaporator sensor temperature.

\*\* It is used to increase the value in the Set screen, Defrost screen and Programming mode. 2. Decrement, Silencing Buzzer and Downloading to Prokey Button:

\* It is used to decrease the value in the Set screen, Defrost screen and Programming mode.

\*\* It is used to silence the buzzer.

\*\* If Prc =0, it is used to download from device to prokey.

3. Defrost Button

ack to main operating screen.

\*\* In the main operation screen; if this button pressed, defrost time value will be displayed.

\*\*In the main operation screen; if this button pressed for 3 seconds, manual defrost starts.

\*\* In the main operation screen; if this button pressed, set value will be displayed. Value can be changed using increment and decrement buttons. When Set button pressed again, value is saved and returns

\*\* To access the programming screen; in the main operation screen, press this button for 5 seconds. \*\* It is used to saving value in the Set screen, Defrost screen and programming screen.

**LED DEFINITIONS** 

5. Compressor output led: \*\* This led indicates that compressor output is active. If any of compressor protection time active, this led blinks

6.Defrost output led:

\*\* This led indicates that defrost output is active. \*\* Blinks once in a second while Defrost delay time.

\*\* Blinks (5 Hz) while entering Defrost time value.

7.Fan output led:

\*\* This led indicates that fan output is active \*\* Blinks once in a second while Fan delay time.

8.Alarm led: \*\* It is active when low alarm and high alarm statuses.

9.Celcius led:

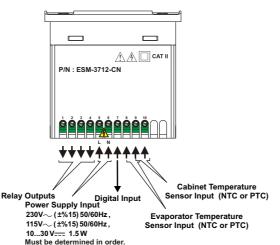
\*\* Indicates that device is in °C mode.

10.Fahrenheit led:

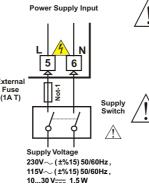
\*\* Indicates that device is in °F mode. 11.Set led:

\*\* Indicates that device is in Set value changing mode.

12.Program led: \*\*Blinks once in a second in programming mode 4. Electrical Wiring Diagram



### 4.1 Supply Voltage Input Connection of the Device



Make sure that the power supply voltage is the same indicated on the instrument Switch on the power supply only after that all the electrical connections have been completed.

Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit.

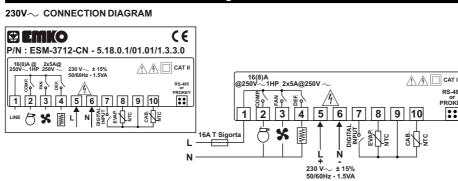
There is no power supply switch on the device. So a power supply switch must be added to the supply voltage input. Power switch must be two poled for seperating phase and neutral, On/Off condition of power supply switch is very important in electrical connectio External fuse that on  $\sim$ power supply inputs must be on

External fuse that on \_\_\_power supply inputs must be on (+)

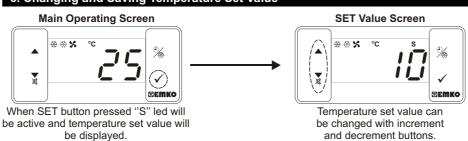
Note-1: External fuse is recommended

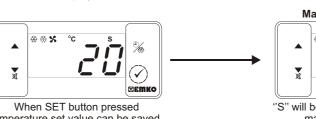
Must be determined in order

### 4.2 Device Label and Connection Diagram



## 6. Changing and Saving Temperature Set Value



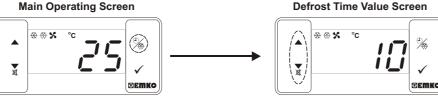


Main Operating Screen

"S" will be inactive and goes back to

Temperature set value parameter (Default=10) MODBUS ADDRESS:40001 Temperature set value, can be programmed between minimum temperature set value 5 u L and maximum temperature set value 5 u H

### 6.1 Changing and Saving Defrost Time Set Value Main Operating Screen



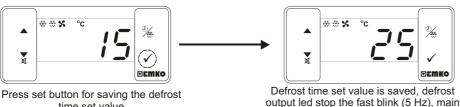
When defrost button is pressed, defrost time set value is shown and defrost output led starts to fast blink (5 Hz).

time set value

Change the defrost time set value with increment and decrement buttons.

operation screen is shown.

## **Main Operating Screen Defrost Time Value Screen**



If no operation is performed in defrost time set value changing mode and temperature set value changing mode for 20 seconds, device turns to main operation screen automatically.

Temperature Alarm Function Selection Parameter (Default = 0) MODBUS ADRES: 40026

If it is selected 0 automatic or manual defrost is not performed.

6.2 Programming Mode Parameter List

PnE

°C selected

Disable

Enable

MODBUS ADDRESS:40004

In ON/OFF control algorithm,

temperature value is tried to keep equal

to set value by opening or closing the last

control element. ON/OFF controlled

system, temperature value oscillates

continuously. Temperature value's

oscillation period or amplitude around set

value changes according to controlled

system. For reducing oscillation period of

temperature value, a threshold zone is

formed below or around set value and

Maximum Temperature Set Value Parameter

5 u L to maximum value of the device scale.

Evaporator sensor is inactive.

Electric defrost.

Hot gas defrost.

It can be adjusted from 1 to 99 hours.

It can be adjusted from 0 to 999 minutes.

Evaporator sensor is active.

Temperature set value can not be greater than this value.

From -20 to 20 °C for NTC(-50°C, 100°C) or PTC(-50°C, 150°C),

From -36 to 36 °F for NTC(-58°F, 212°F) or PTC(-58°F, 302°F).

From -36 to 36°F for NTC(-58°F, 212°F) or PTC(-58°F, 302°F),

this zone is named hysteresis.

parameter 5 u H

Scale) MODBUS ADDRESS:40005

Temperature Unit Selection Parameter ( Default = 0 ) MODBUS ADDRESS:40002

Decimal Seperator Enabling Parameter (Default = 0) MODBUS ADDRESS:40003

OFF

Minimum Temperature Set Value Parameter(Default =Minimum Value of Device

Temperature set value can not be lower than this value. This parameter value can be

adjusted from minimum value of device scale to maximum temperature set value

This parameter value can be adjusted from minimum temperature set value parameter

Evaporator Sensor Selection Parameter (Default = 1) MODBUS ADDRESS:40008

Evaporator Sensor Offset Parameter ( Default = 0 ) MODBUS ADDRESS:40009 If evaporator sensor selection parameter 525 is 1, then this parameter is observed. From -20 to 20°C for NTC(-50°C, 100°C) or PTC(-50°C, 150°C),

Cabinet Sensor Offset Parameter (Default = 0) MODBUS ADDRESS:40007

(Default = Maximum Value of Device Scale) MODBUS ADDRESS:40006

From -10.0 to 10.0°C for NTC(-50.0°C, 100.0°C) or PTC(-50.0°C, 150.0°C),

From -18.0 to 18.0°F for NTC(-58.0°F,212.0°F) or PTC(-58.0°F,302.0°F).

From -10.0 to 10.0°C for NTC(-50.0°C.100.0°C) or PTC(-50.0°C.150.0°C).

From -18.0 to 18.0 °F for NTC(-58.0°F,212.0°F) or PTC(-58.0°F,302.0°F).

Defrost Time Parameter (Default =10) MODBUS ADDRESS:40011

Defrost Type Selection Parameter (Default = 0) MODBUS ADDRESS:40010

Defrost Repeat Cycle Parameter (Default = 1) MODBUS ADDRESS:40012

Hysteresis Parameter for Compressor Output ( Default = 1 )

from 0.1to 10.0°C for NTC (-50.0°C,100.0°C) or PTC (-50.0°C,150.0°C)

from 0.1 to 18.0°F for NTC (-58.0°F,212.0°F) or PTC(-58.0°F,302.0°F)

from 1 to 20°C for NTC (-50°C, 100°C) or PTC (-50°C, 150°C)

from 1 to 36°F for NTC (-58°F, 212°F) or PTC (-58°F, 302°F)

Temperature alarm function is inactive. Absolute alarm is selected. If temperature lower than  $\mathbb{R}_{uL}$  and higher than R ப H , then alarm is on. Relative alarm is selected. Alarm operates according to the set value. If cabinet

temperature value is below (Set -  $\boxed{R_{\, \mbox{$ \mbox{$ $ $ \mbox{$ \mbox{$ $ $ $ $ \mbox{$ $ $ $ $ }}}}$ ) or above (Set + $\boxed{R_{\, \mbox{$ \mbox{$ $ $ $ $ $ $ $ }}}$ ), alarm ocurs. Temperature Alarm Minimum Parameter Temperature Alarm Minimum rarameter
(Default = Minimum Value of Device Scale) MODBUS ADRES:40027 For RLS = 1, this parameter value can be adjusted from minimum value of device scale to temperature alarm maximum parameter  $\boxed{A \cup H}$  value. For  $\boxed{A \subseteq S} = 2$ , this

parameter value can be adjusted 0 to %50 of the device scale. Temperature Alarm Maximum Parameter (Default =Maximum Value of Device Scale ) MODBUS ADRES:40028 For  $\boxed{R \downarrow 5} = 1$ , this parameter value can be adjusted from temperature alarm minimum parameter Rull value to maximum value of device scale. For RLS = 2, this parameter

value is can be adjusted 0 to %50 of the device scale. Temperature Alaini Cir 25...
MODBUS ADDRESS:40029 Temperature Alarm On Delay Time Parameter(Default = 0) Temperature Alarm On Delay Time can be defined with this parameter. It can be adjusted from 0 to 99 minutes.

Temperature Alarm Delay After Power On Parameter (Default = 0) MODBUS ADDRESS:40030 When power is first applied to the device, this time delay must be expired for activation of emperature alarm. It can be adjusted from 0 to 99 minutes.

Fan Operation Selection Parameter (Default = 1) MODBUS ADDRESS:40031 ∏ Fan is OFF. Fan is ON.

Fan operates according to the evaporator sensor temperature value. Fan operates according to the (cabinet - evaporator) temperature value. Fan Stopping Temperature Parameter (Default = 2°C) MODBUS ADDRESS:40032 Fan stopping temperature can be defined with this parameter. It can be adjusted from minimum value to maximum value of device scale.

Hsyteresis Parameter for Fan Output (Default = 1) MODBUS ADDRESS:40033 From 1 to 20°C for NTC (-50°C, 100°C), from 1 to 36°F for NTC (-58°F, 212°F), from 0.1 to 10.0°C for NTC (-50.0°C,100.0°C), from 0.1 to 18.0°F for NTC (-58.0°F,212.0°F)

Fan Activity Selection According to the Compressor and Defrost (Default = 0) MODBUS ADDRESS:40034

Fan operates according to the FEY parameter. Fan operates according to the Fty parameter, but fan is stopped if commpressor is stops Fan operates according to the Fty parameter, but fan is stopped during defrost and dripping time.

Fan operates according to the F & Y parameter. If compressor stops, during defrost and dripping operations fan stops Fan Delay Time After Completion of Dripping Time Parameter (Default = 2) MODBUS ADDRESS:40035

Fan Delay Time After Completion of Dripping Time is defined with this parameter. It can be adjusted from 0 to 15 minutes.

Defrost Stopping Temperature Parameter (Default = 2°C) MODBUS ADDRESS:40013 For evaporator sensor selection parameter  $\lceil \frac{1}{5} \rceil \le 1$  is 1 (evaporator sensor is active), while defrost operation, if evaporator temperature reaches to temperature that defined at this parameter in a shorter time than  $d \vdash 1$  parameter, then defrost operation stops. Defrost at Power On Selection and Defrost Delay Parameter Defrost at Power Un Selection and Defrost 25.40014 (Default = \_\_\_\_\_\_) MODBUS ADDRESS:40014 It can be adjust from 0 to 99 minutes. When tihs parameter is 0, if decrement button is pressed, observed. In this condition system goes through a defrost cycle at the end of the defrost repeat cycle time <code>[]-[]</code> after power on. If this parameter value is between 0 and 99, then system goes through a defrost cycle at the end of the this parameter time Display Status During Defrost Parameter ( Default = 3) MODDBUS ADRESS:40015 The cabinet temperature value is displayed during defrost. Cabinet temperature value at the start of the defrost is displayed during defrost. Temperature set value is displayed during defrost. JEF is displayed to indicate the defrost is in progress. Displaying Current Temperature Delay After Defrost Parameter (Default = 0) MODDBUS ADRESS:40016 This parameter defines the delay for displaying current temperature being active after defrost. It can be adjusted from 0 to 255 minutes. Dripping Time Parameter (Default = 2) MODBUS ADDRESS:40017 This parameter defines for dripping time after defrost. It can be adjusted from 0 to 15 minutes. Temperature Alarm Delay After Dripping Parameter (Default = 0) MODBUS ADDRESS:40018 This parameter defines the delay for temperature alarm being active after dripping time completion. It can be adjusted from 0 to 15 minutes. Compressor Start Delay at Power On Parameter ( Default = 0 ) MODBUS ADDRESS:40019 When power is first applied to the device, This time delay must be expired for activation of compressor. It can be adjusted from 0 to 20 minutes Compressor Start-Start Delay Parameter ( Default = 0 ) MODBUS ADDRESS:40020 This time delay must be expired between two activation of the compressor. It can be adjusted from 0 to 20 minutes. Minimum Compressor OFF Time Parameter ( Default = 0 )MODBUS ADDREDS:40021 When compressor is inactive, this time delay must be expired for activation of the compressor. It can be adjusted from 0 to 20 minutes. Minimum Compressor ON Time Parameter ( Default = 0 )MODBUS ADRES:40022 When compressor is active, this time delay must be expired for deactivation of the compressor. It can be adjusted from 0 to 20 minutes. Cabinet Probe Defect Parameter ( Default = 0 ) MODBUS ADDRESS:40023 Compressor is OFF in case of cabinet probe defect. Compressor is ON in case of cabinet probe defect Compressor operates periodically according to  $P_{\square \square}$  and  $P_{\square}F$  time periods in case of cabinet probe defect. Compressor Active Time in Case of Cabinet Probe Defect Parameter (Default = 0) MODBUS ADDRESS:40024 If cabinet probe defect parameter [PdF] is 2, then this parameter is observed. It canbe adjusted from on to 99 minutes Compressor Inactive Time in Case of Cabinet Probe Defect Parameter ( Default = 0 ) MODBUS ADDRESS:40025 If cabinet probe defect parameter PJF is 2, then this parameter is observed It canbe adjusted from DF to 99 minutes.

> Digital Input Contact Selection Parameter (Default = 1) MODBUS ADDRESS:40036 Digital input is inactive. NO "normally open" digital input is active when the contact is closed. NC "normally close" digital input is active when the contact is opened.

Digital Input Function Selection Parameter ( Default = 0 ) MODBUS ADDRESS:40037 If digital input contact selection parameter value d L = 0, this parameter is not observed. When the digital input is active, fan is stopped.  $\boxed{Rd}$  screen will be displayed. When the digital input is active, compressor is stopped. Run screen will be displayed and defrost operation will be disabled. If Buzzer function selection

parameter  $b \cup F = 2$  or 4 buzzer is active. When the digital input is active, first fan stops, 10 seconds later compressor stops. R d | will be displayed at main operation screen. When the digital input is active, defrost starts. When the digital input is active, alarm will be active. A in will be displayed at

main operation screen. If Buzzer function selection parameter  $\frac{1}{2} \cdot \frac{1}{2} \cdot F = 2$  or 4 buzzer is active. 

parameter is 0, if decrement button is pressed, --- is observed. In this condition the effect will be ended when digital input is deactive. Buzzer Function Selection Parameter (Default = 0) MODBUS ADDRESS:40039 Buzzer is inactive.

Buzzer is active during defrost operation. Buzzer is active if an alarm occurs. Buzzer is active during cabinet sensor failures. Buzzer is active during defrost, alarm or cabinet sensor failures.

Buzzer Active Time ( Default = - - - ) MODBUS ADDRESS:40040 If buzzer function selection parameter value buF = 0, this parameter is not observed.

Buzzer active time can be define with this parameter. It can be adjusted from 1 to 99 minutes. When this parameter is 1, if decrement button is pressed, - - - is observed. In this condition buzzer is active till buzzer silence button is pressed. Button Protection Parameter (Default = 0) MODBUS ADDRESS:40041

There is no protection. Defrost time set value can not be changed and manual defrost is not available.

Temperature set value can not be changed. Defrost time set value and temperature set value can not be changed and manual defrost is not available.

Defrost time can not be changed, Defrost ON/OFF operation is available. Communication Mode Selection Parameter( Default = 0 ) MODBUS ADRESS:40042

PROKEY communication selected. RS485 communication selected.

Slave ID Parameter (Default = 1) MODBUS ADDRESS=40043 Device communication address parameter (1 to 247).

Programming Mode Accessing Password (Default = 0) MODBUS ADDRESS:40044 It is used for accessing to programming mode. It can be adjusted from 0 to 999. If it is 0, password is not entered for accessing to the parameters. If password is '12' only H5 L, طك ، , ط ر [] can be accesible.