



Please read this document carefully before using this product. The guarantee will be invalidated if the device is damaged by not following instructions detailed in the manual. The company shall not be responsible for any damage or losses however caused, which may be experienced as a result of the installation or use of this product.

ENDA EDT2412A TEMPERATURE CONTROLLER

Thank you for choosing ENDA EDT2412A temperature controller.

- ▶ 35x77mm.
- ▶ On-Off control.
- ▶ Relay output type can be selected for defrost or lighting.
- ▶ Single NTC probe input.
- ▶ Offset value can be entered for NTC input.
- ▶ Compressor protection parameters.
- ▶ On probe failure, output status can be set to ON, OFF or periodic.
- ▶ Upper and Lower setpoint value limits can be set.
- ▶ Defrost duration and interval can be adjusted.
- ▶ 6 different warning tones.
- ▶ Deviation high and low alarm values.
- ▶ Temperature unit can be selected °C or °F.
- ▶ Digital input.
- ▶ Manual defrost or lighting feature.
- ▶ Defrosting or lighting (configurable) can be started by using digital input.
- ▶ Transfer device parameter settings with ENDA key - no power-up required.
- ▶ RS485 ModBus protocol communication feature (optional).
- ▶ CE marked according to European Norms.



Order Code : EDT2412A - - -

1 - Supply Voltage
230.....230V AC

LV.....10-30V DC /
8-24V AC

2 - Output
20.....20A Contact output

08.....08A Contact output

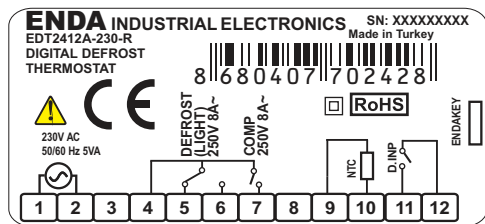
3 - Modbus
RS...Modbus
Specified at order)



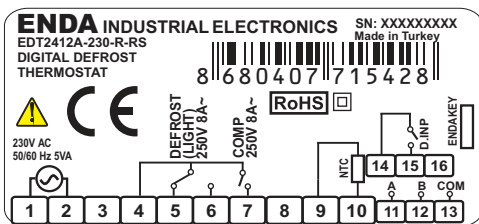
CONNECTION DIAGRAM

ENDA EDT2412A is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must be carried out by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that are connected to the device must be free of electrical power.

Device must be protected against inadmissible humidity, vibrations, severe soiling and make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.



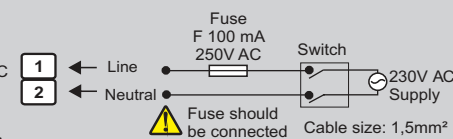
Equipment is protected throughout by **DOUBLE INSULATION**



Holding screw 0.4-0.5Nm.

NOTE:

SUPPLY:
184-253V AC
veya
10-30V DC/
8-24V AC
50/60Hz 5VA

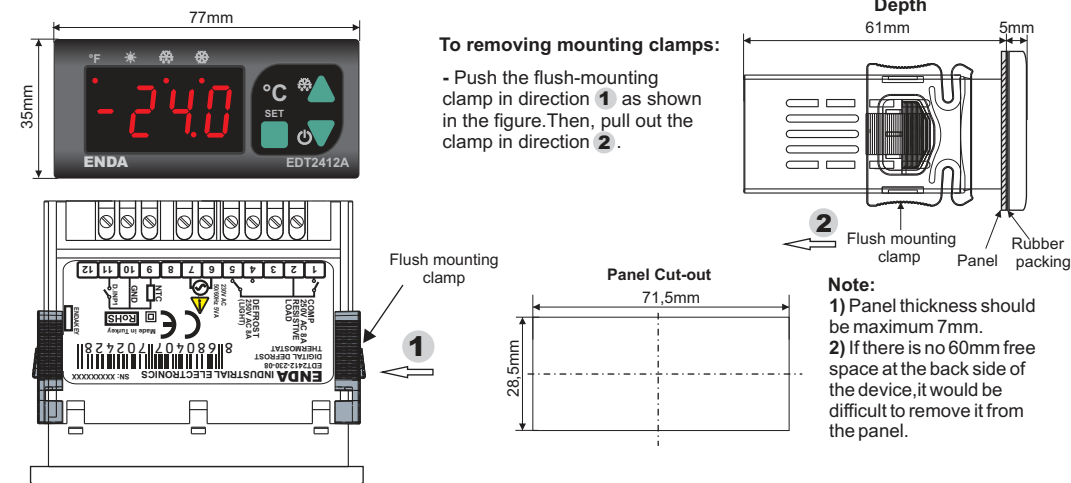


Note:

- 1) Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
- 2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

ENVIRONMENTAL CONDITIONS	
Ambient / Storage Temperature	0 ... +50°C/-25 ... 70°C (without icing)
Relative Humidity	Relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
Protection Class	According to EN60529; Front panel : IP65 Rear Panel : IP20
Height	Max. 2000m
⚠ KEEP AWAY device from exposed to corrosive, volatile and flammable gases or liquids and DO NOT USE the device in similar hazardous locations.	
ELECTRICAL CHARACTERISTICS	
Supply Voltage	230V AC 50/60Hz ; 10-30V DC /8-24V AC SMPS
Power Consumption	Max. 5VA
Connection	2.5mm ² screw-terminal connections
Scale	-60.0 ... +150.0°C (-76.0 ... +302.0°F)
Sensitivity	0.1°C (Can be selected as 0.1°C or 1°C.)
Accuracy	±1°C
Time Accuracy	±1%
Display	4 digits, 12.5mm, 7 segment LED
EMC	EN 61326-1: 2013
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)
OUTPUTS	
Compressor Relay Output	EDT2412A-X-R ; Relay : NO+NC 250V AC,8A (resistive load), 1/2hp, 0.37kW 240V AC (inductive load) EDT2412A-X-P ; Relay : NO 277V AC,20A (resistive load), 2hp, 1.49kW 250V AC (inductive load)
Defrosting and Lighting Relay Output	EDT2412A-X-R ; Relay : NO+NC 250V AC, 8A (resistive load), 1/2hp, 0.37kW 240V AC (inductive load)
Life Expectancy for Compressor Relay Output	EDT2412A-X-R ; No-load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching. EDT2412A-X-P ; No-load 10.000.000 switching; 277V AC, 20A (resistive load) 100.000 switching.
Life Expectancy for Defrosting and Lighting Relay Output	EDT2412A-X-R ; No-load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching.
CONTROL	
Control Type	Single set-point control
Control Algorithm	On-Off control
Hysteresis	Adjustable between 1 ... 20.0°C.
HOUSING	
Housing Type	Suitable for flush -panel mounting
Dimensions	W77xH35xD61mm
Weight	Approx. 190g (After packing)
Enclosure Material	Self extinguishing plastics.
⚠ Avoid any liquid contact while the device is switched on. DO NOT clean the device with solvent (thinner, gasoline, acid etc.) and / or abrasive cleaning agents.	

DIMENSIONS



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EDT2412A-EN-02-220103

°F FAHRENHEIT LED : "°F" Led lights up if the temperature unit in Fahrenheit. It also indicates if a parameter contains in the hidden or user menu.
 LIGHTING LED : Lighting Led lights up during Lighting output is active.
 DEFROST LED : Defrost Led lights up when the defrost operation starts.
 COMPRESSOR LED : Lights when the compressor output is active. Blinks during the compressor process in delay time.
 SET : Indicates the setpoint value in "Running Mode". Indicates the selected parameter value in "Programming Mode".
 ▲ : Provides the transition to the next parameter in "Programming Mode". If the parameter is being adjusted, it increases the parameter's value. Constantly holding this key, the parameter value rapidly increases.
 ▼ : Provides the transition to the previous parameter in "Programming Mode". If the parameter is being adjusted, it decreases the parameter's value. Constantly holding this key, the parameter value rapidly decreases.

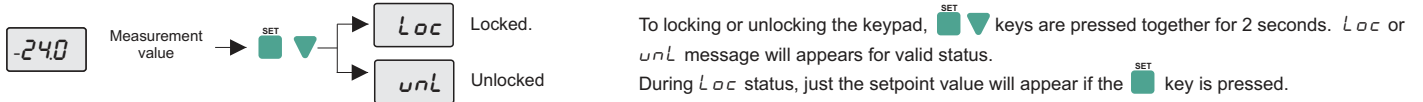
FRONT PANEL COMMANDS

1. Viewing and Changing The set point



If **SET** key is pressed for 3 seconds in "Running Mode", setpoint value is displayed and it can be changed by using **▼▲** navigation keys.

2. Locking / Unlocking the Keys



3. Manual Defrost Process

Before starting this process, dEF must be selected in oLTP parameter.

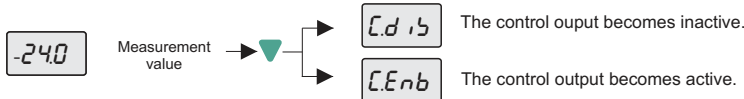
By pressing to **▲** key for 2 seconds in "Running Mode", the defrost process will start or stop manually.

4. Manual Lighting Process

Before starting this process, LGht must be selected in oLTP parameter.

By pressing to **▲** key for 2 seconds in "Running Mode", the lighting process will start or stop manually.

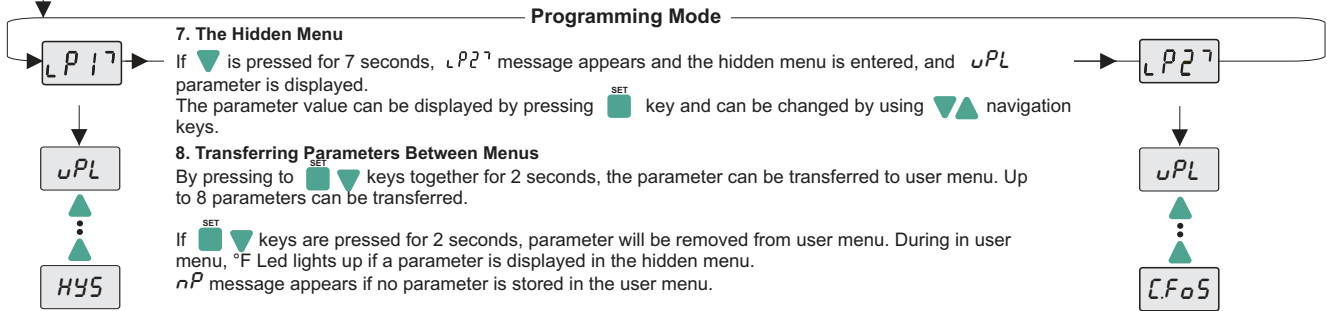
5. Activating / Inactivating The Control Outputs



In "Running Mode", if the **▼** key is pressed for 2 seconds, the control outputs becomes inactive. On/Off led lights up and the device will run as an indicator. If **▼** key is pressed for 2 seconds during control outputs are inactive, the control operation will be continued.

6. Changing Parameter Values

If **▼▲** keys are pressed together for 2 seconds, *LP17* message appears and the user menu is entered, and the first parameter of the user menu is displayed. The parameter value can be displayed by pressing **SET** key and can be changed by using **▼▲** navigation keys. If no operation is performed for 3 seconds while a parameter value displayed or by pressing to **SET** key, the parameter name will be re-displayed. If **▼▲** keys are pressed together while the parameter name displayed, "Running Mode" is entered immediately.



ERROR MESSAGES

PFR No communication with thermostat sensor. (Sensor and/or cable broken or not connected)

--- Temperature value is higher than the scale.

P5C Thermostat probe or connection line short-circuited.

--- Temperature value is lower than the scale.

ALARM SITUATION

WW -24.0
1) Measured value flashes and a buzzer sounds if the 5nd parameter is not 0 when the alarm condition occurs. Buzzer can be silenced by pressing **▲** key.

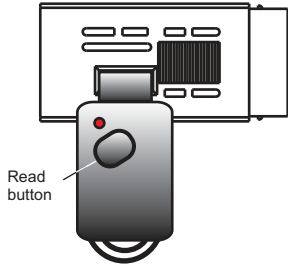
WW ER
2) Indicates the external alarm is activated and the outputs are not affected.

WW SA
3) Indicates the external alarm is activated
4) Buzzer can be silenced by pressing any key.

FACTORY DEFAULTS

Power-up the device by pressing and holding down the **▼** key for factory defaults. *dPAr* message will be displayed if the operation success.

ENDAKEY PARAMETER TRANSFER



TRANSFERRING THE PARAMETERS FROM ENDAKEY TO DEVICE

While in "Running Mode", if key on device or "Read" button on "ENDAKEY" is pressed, "dL" message appears on display and parameters are read and transferred to the device. If the parameter transfer is successful, the "rEF" message appears and the device begins to work with the loaded parameter values. If the parameters are wrong, incorrect or "ENDAKEY" is faulty, "Err" message appears. Parameters will not be changed on device.

TRANSFERRING THE PARAMETERS FROM DEVICE TO ENDAKEY

While in "Running Mode", if key is pressed on device, "uL" message appears on display and parameters are read and transferred to the device. If process succes, "Suc" message appears. In case of failure, "Err" message appears. Parameters will not be changed on device.

NOTE 1 : No power-up required for transferring the parameter by using "ENDAKEY". For long battery life, "ENDAKEY" must be disconnected from device after the transferring process.

NOTE 2 : Please specify at order "ENDAKEY" if required.

CONTROL PARAMETERS

		MIN.	MAX.	UNIT	DEF. SET
<i>uPL</i>	Upper limit for setpoint value.	-600	<i>uPL</i>	°C	150
<i>LoL</i>	Lower limit for setpoint value.	<i>LoL</i>	1500	°C	-60
<i>HYS</i>	Switch hysteresis for compressor.	0.1	200	°C	2
<i>oFF</i>	Offset value for the refrigeration	-200	200	°C	0

CONFIGURATION PARAMETERS

<i>oLYP</i>	Defrost / Lighting relay, output type selection. (<i>DEF</i> : Relay is used as defrost relay, <i>LGHt</i> : Relay is used as lighting relay.	<i>DEF</i>	<i>LGHt</i>	<i>DEF</i>
<i>Un t</i>	Temperature unit	°C	°F	°C
<i>dPnt</i>	Decimal point (<i>no</i> = No decimal place added ie. 22°C, <i>YES</i> = Decimal place added ie. 22.3°C).	<i>no</i>	<i>YES</i>	<i>no</i>
<i>Snd</i>	Buzzer sound type. 6 different sounds can be selected. The alarm will be silent when 0 is selected.	0	6	0
<i>d.inP</i>	Digital input types. <i>nd</i> : Digital input not used. <i>ER</i> : External alarm. <i>ER</i> message flashes and the output will not change. <i>SR</i> : Important external alarm. <i>SR</i> message flashes and the relay outputs will be switched off. <i>dF</i> : Defrost operation starts. <i>LGHt</i> : Lightening operation starts.	<i>nd</i>	<i>dF</i>	<i>nd</i>
<i>dd i</i>	Digital input delay. The period of the digital inputs to be active.	0:00	99:00	0:00
<i>dPo</i>	Digital input polarity. <i>CL</i> = Active when digital input contact is closed. <i>oP</i> = Active when digital input contact is open.	<i>CL</i>	<i>oP</i>	<i>CL</i>

COMPRESSOR PROTECTION PARAMETERS

<i>CPon</i>	Delay time for the compressor after power is on.	0:00	99:00	min:sec 1:00
<i>CFoS</i>	Delay time required for the compressor to restart following a stop.	0:00	99:00	min:sec 1:00
<i>CPPn</i>	On time for the compressor output in the case of probe failure.	0:00	99:00	min:sec 0:00
<i>CPPF</i>	Off time for the compressor output in the case of probe failure	0:00	99:00	min:sec 1:00

DEFROST CONTROL PARAMETERS

<i>dSnt</i>	Smart Defrost selection. <i>no</i> : The defrosting counter is reduced regardless (between 2 defrosting process) the condition of the compressor. <i>YES</i> : The defrosting counter is reduced as long as the compressor is running.	<i>no</i>	<i>YES</i>	<i>no</i>
<i>dLYP</i>	Defros type selection (<i>ELC</i> : electric defrost (compressor is switched off), <i>GRS</i> : hot gas (compressor is on))	<i>ELC</i>	<i>GRS</i>	<i>ELC</i>
<i>ddur</i>	Defrost duration (If <i>ddur</i> parameter is set to <i>no</i> , automatic and manual defrost will be disabled).	0:00	99:00	min:sec 1:00
<i>d.int</i>	The time between 2 consecutive defrosts.	1:00	99:00	hr:min 1:00
<i>ddSP</i>	Defrost process monitoring configuration. <i>rE</i> = Real temperature is displayed during defrost. <i>Lc</i> = The latest measured temperature value before starting the defrost is displayed. This value remains constant until the defrosting process ends.	<i>Lc</i>	<i>rE</i>	<i>Lc</i>
<i>ddrE</i>	Real temperature monitoring delay time at the end of the defrosting process.	0:00	99:00	min:sec 1:00
<i>dPon</i>	The defrost process starts when power-up (<i>no</i> = No <i>YES</i> = Yes).	<i>no</i>	<i>YES</i>	<i>no</i>
<i>ddPo</i>	Delay time for defrosting after power is on.	0:00	99:00	min:sec 1:00
<i>ddrt</i>	Dripping (discharge) time	0:00	99:00	min:sec 2:00

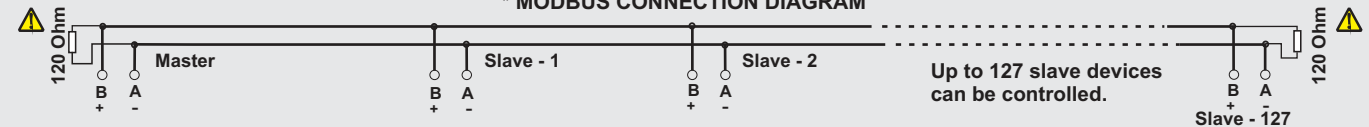
ALARM CONTROL PARAMETERS

<i>RuPL</i>	Limit for upper alarm level. When <i>REYP</i> is changed, <i>RuPL</i> should be readjusted.	<i>RLoL</i>	1500	°C 150
<i>RLoL</i>	Limit for lower alarm level. When <i>REYP</i> is changed, <i>RLoL</i> should be readjusted.	-600	<i>RuPL</i>	°C -60
<i>RHYS</i>	Hysteresis alarm	0.1	200	°C 2
<i>REYP</i>	Alarm configuration. (<i>RbS</i> = Independent alarm. Alarm values are <i>RLoL</i> and <i>RuPL</i> .) (<i>rEF</i> = Relative alarm. Alarm values are <i>SET-RLoL</i> and <i>SET+RuPL</i> .) NOTE: Upper and Lower alarm level variables are determined according to the "REYP" parameter. If <i>REYP</i> = <i>RbS</i> , <i>RLoL</i> and <i>RuPL</i> . If <i>REYP</i> = <i>rEF</i> , <i>LoL</i> = <i>SET-RLoL</i> and <i>RuPL</i> .	<i>RbS</i>	<i>rEF</i>	<i>RbS</i>
<i>RdFL</i>	Time delay to display alarm message after alarm is on.	0:00	99:00	min:sec 0:00
<i>RdPo</i>	Time delay to display alarm message after power is on.	0:00	99:00	hr:min 0:10

MODBUS COMMUNICATION PARAMETERS

<i>RdS</i>	Modbus slave device address for device	1	247	1
<i>bRud</i>	Modbus communication speed (Baud rate, 0 : <i>oFF</i> , 1 : 1200 , 2 : 2400 , 3 : 4800 , 4 : 9600 , 5 : 1920)	<i>oFF</i>	1920	bps 9600

* MODBUS CONNECTION DIAGRAM



Termination should be accomplished by attaching 120 Ohm resistors to the start and at the end of the communication line.

* Applies to devices with Modbus function.

ENDA EDT2412A DIGITAL THERMOSTAT MODBUS PROTOCOL ADDRESS MAP

1.1 HOLDING REGISTERS

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	word	Set value	--	Read / Write
0001d	0x0001	word	Set point upper limit	<i>uPL</i>	Read / Write
0002d	0x0002	word	Upper level alarm	<i>RuPL</i>	Read / Write
0003d	0x0003	word	Set point lower limit	<i>LoL</i>	Read / Write
0004d	0x0004	word	Lower level alarm	<i>RLoL</i>	Read / Write
0005d	0x0005	word	The offset value for the cooling	<i>oFF</i>	Read / Write
0006d	0x0006	word	Cooling hysteresis	<i>HYS</i>	Read / Write
0007d	0x0007	word	Switch hysteresis for alarm	<i>RHYS</i>	Read / Write
0008d	0x0008	word	Type of buzzer sound	<i>Snd</i>	Read / Write
0009d	0x0009	word	Digital input types .0= <i>nd</i> ;1= <i>ER</i> ;2= <i>BR</i> ;3= <i>df</i> ;4= <i>LGHt</i>	<i>d.inP</i>	Read / Write
0010d	0x000A	word	Digital input delay	<i>ddi</i>	Read / Write
0011d	0x000B	word	Delay time for the compressor after power is on.	<i>CPon</i>	Read / Write
0012d	0x000C	word	Delay time required for the compressor to restart following a stop.	<i>CFoS</i>	Read / Write
0013d	0x000D	word	On time for the compressor output in the case of probe failure	<i>CPPn</i>	Read / Write
0014d	0x000E	word	Off time for the compressor output in the case of probe failure	<i>CPPF</i>	Read / Write
0015d	0x000F	word	Defrost duration	<i>ddur</i>	Read / Write
0016d	0x0010	word	The time between 2 consecutive defrosts.	<i>d.int</i>	Read / Write
0017d	0x0011	word	Delay time for defrosting after power is on.	<i>ddPo</i>	Read / Write
0018d	0x0012	word	After the cooling process of cooling start-up delay	<i>ddrE</i>	Read / Write
0019d	0x0013	word	Dripping (discharge) time	<i>ddrt</i>	Read / Write
0020d	0x0014	word	Time delay to display alarm message after alarm is on.	<i>RdFL</i>	Read / Write
0021d	0x0015	word	Time delay to display alarm message after power is on.	<i>RdPo</i>	Read / Write

1.2 INPUT REGISTERS

Input Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured temperature value (°C / °F)	--	Read

* Holding and Input Register parameters of type integer, those "signed integer" is defined as the decimal part of and associated with these parameters. (So, "14.0" is a parameter value of "140" will be read in). Relevant parameters for a period of "mm:ss" type ones in seconds, "hh:mm" while those species defined in minutes.

1.3 DISCRATE INPUTS

Discrete Inputs Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	bit	Control output status (0=OFF; 1=ON)	--	Read
0001d	0x0001	bit	Defrost output status (0=OFF; 1=ON)	--	Read

1.4 COILS

Coil Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
00d	0x00	Bit	Defrost / Lighting output selection. OFF = <i>dEF</i> . ON = <i>LGHt</i>	<i>oLYP</i>	Read / Write
01d	0x01	Bit	Temperature unit. OFF = <i>°C</i> , ON = <i>°F</i>	<i>Unit</i>	Read / Write
02d	0x02	Bit	Decimal point . OFF= <i>no</i> . ON= <i>YES</i>	<i>dPnt</i>	Read / Write
03d	0x03	Bit	Digital input polarity. OFF = <i>cl</i> . ON = <i>oP</i>	<i>dPo</i>	Read / Write
04d	0x04	Bit	Smart Defrost selection. OFF = <i>no</i> , ON= <i>YES</i>	<i>dSn̄t</i>	Read / Write
05d	0x05	Bit	Defrost type selection OFF = <i>ELC</i> , ON = <i>GRS</i>	<i>dLYP</i>	Read / Write
06d	0x06	Bit	During defrost, display configuration. OFF = <i>Lc</i> , ON = <i>rE</i>	<i>ddSP</i>	Read / Write
07d	0x07	Bit	Defrosting process begins with energy. OFF = <i>no</i> , ON = <i>YES</i>	<i>dPon</i>	Read / Write
08d	0x08	Bit	Alarm configuration. OFF = <i>RbS</i> , ON = Relative alarm <i>rEF</i>	<i>RLYP</i>	Read / Write