



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 EDT2423A TEMPERATURE CONTROLLER

Thank you for choosing ENDA EDT2423A temperature controller.

- ▶ 35x77mm size.
- ▶ On-Off control.
- ▶ Three relay outputs for cooling, defrost and fan control.
- ▶ Two NTC probe input for cooling and defrost control.
- ▶ Offset point can be entered for NTC input.
- ▶ Compressor protection parameters can be entered.
- ▶ In case of probe failure, compressor operation can be set to ON, OFF or periodic.
- ▶ Selectable smart defrost feature.
- ▶ Defrost initiated by evaporator temperature, time dependent or manual operation.
- ▶ Lower and upper limits of the set point can be set.
- ▶ Defrost time and interval can be adjusted.
- ▶ Lower and upper alarm limit can be set to dependent on set point.
- ▶ Temperature can be displayed in °C or °F.
- ▶ Digital input.
- ▶ Transfer device parameter settings with ENDA key - no power-up required.
- ▶ RS485 communication features with Modbus RTU protocol (optional).
- ▶ CE marked according to European standards.



Order Code : EDT2423A - 

1	2	3

- 1 - Supply Voltage**  
 230.....230V AC  
 24 .....24V AC/DC  
 12 .....12V AC/DC  
 SM.....9-30V DC/7-24V AC  
 24V.....12V / 24V DC

- 2 - Contact Current Selection**  
 R.....8A Contact output

- 3 - ModBus Selection**  
 RS.....ModBus (Optional)  
 Blank.....N/A  
**(Must be specified at order)**

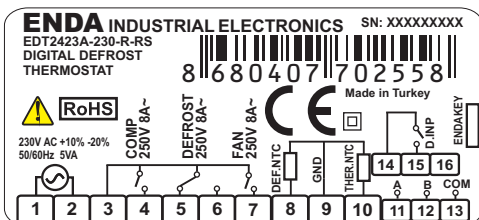
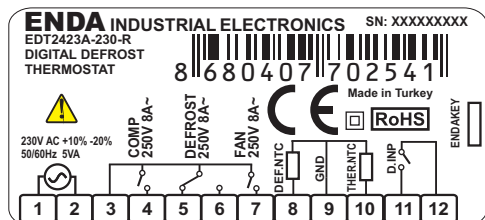


## CONNECTION DIAGRAM



ENDA EDT2423A 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.

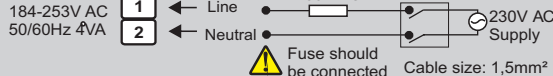


Equipment is protected throughout by **DOUBLE INSULATION**

Holding screw 0.4-0.5Nm.

### NOTE:

SUPPLY:



### 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

**Do not use the device in locations subject to corrosive and flammable gasses.**

## ELECTRICAL CHARACTERISTICS

Supply voltage	230V AC +10% -20%, 50/60Hz ; 12V AC/DC ± %10 or 24V AC/DC ±%10
Power consumption	Max. 5VA
Connection	2.5mm <sup>2</sup> 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	For EDT2423A-X-R ; Relay : NO 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load)
Defrosting relay output	For EDT2423A-X-R ; Relay : NO+NC 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load)
Fan relay output	For EDT2423A-X-R ; Relay : NO 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load)
Life expectancy	For EDT2423A-X-R; Without load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching.

## CONTROL

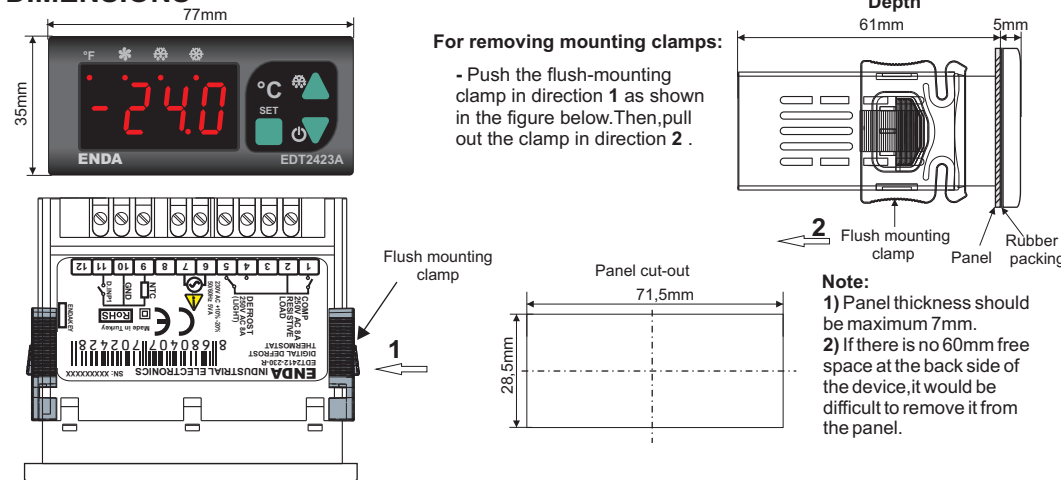
Control type	Single set-point control
Control algorithm	On-Off control
Hysteresis	Adjustable between 1 ... 20.0°C.

## HOUSING

Housing type	Suitable for flush -panel mounting
Dimensions	W77xH35xD61mm
Weight	Approx. 190g (After packing)
Enclosure material	Self extinguishing plastics.

**While cleaning the device, solvents (thinner, benzine, acid etc.) or corrosive materials must not be used.**

## DIMENSIONS



**For removing mounting clamps:**

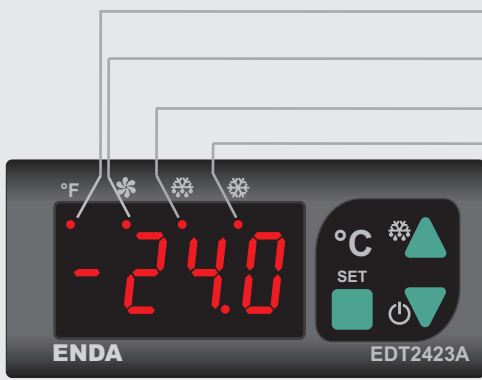
- Push the flush-mounting clamp in direction 1 as shown in the figure below. Then, pull out the clamp in direction 2 .

- Note:**
- 1) Panel thickness should be maximum 7mm.
  - 2) If there is no 60mm free space at the back side of the device, it would be difficult to remove it from the panel.



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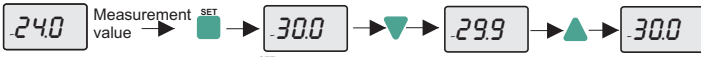
**ENDA**  
 EDT2423A-E-03-170404



- °F **FAHRENHEIT LED** : In parameter value or the measured temperature value "°F" unit while this LED lights up. In the hidden menu at the same time the user menu parameter is shown the LED lights up.
- FAN LED** : While FAN control is in progress, FAN LED lights up if output is active. While waiting for FAN time delay, FAN LED flashes.
- DEFROST LED** : Lights up during DEFROST.
- COMPRESSOR LED** : If compressor output is active, COMPRESSOR LED lights up. While waiting for COMPRESSOR time delay, COMPRESSOR LED flashes.
- SET**  
Indicates set point in "Running Mode" and indicates selected set point of parameter in "Programming Mode"
- Provides a transition to the next parameter while in "Programming Mode". Used to increase the value of a parameter. If this key is pressed continuously, parameter value increases rapidly.
- Provides a transition to the previous parameter while in "Programming Mode". Used to decrease the value of a parameter. If this key is pressed continuously, parameter value decreases rapidly.

## FRONT PANEL COMMANDS

### 1. Viewing and Changing The set point



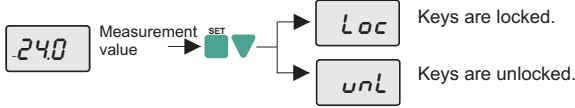
While in the running mode, if key is pressed set point is displayed for 3 seconds. While in this case, the set point is changed with keys.

### 2. Viewing Defrost Measurement Value



While in the running mode; if keys are pressed, defrost probe measurement value is displayed for 3 seconds

### 3. Locking and Unlocking Keys



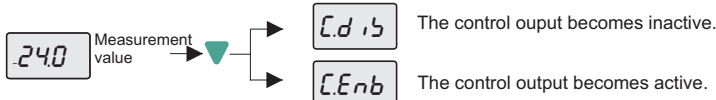
While in the operating mode, if keys are pressed together among 2 seconds the *Loc* message is displayed and the keys are locked. If the keys are locked, keys are pressed for 2 seconds again *unL* message is displayed and key lock is opened and is returned to the normal way of working. While keys are locked,

if key is pressed, the set point can be displayed but the value can not be changed. While the keys are locked, key outside if a key is pressed the *Loc* message is seen.

### 4. Manual Defrost Process

While in the operating mode, if key is pressed for 2 seconds the defrost process is started as manual. If *ddur = 0*, the manual defrost will also be disabled.

### 5. Activating / Inactivating The Control Outputs



\* When in the running mode, if the control outputs are inactive, *oFF* message displays periodically.

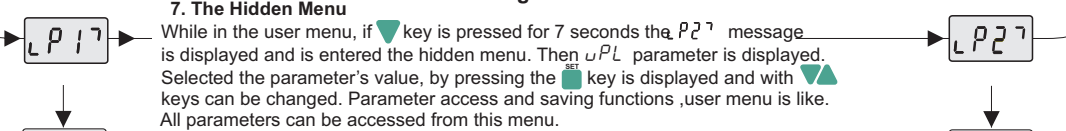
When in the running mode, if key is pressed for 2 seconds, *Cd is* message is displayed and control outputs becomes to the inactive position, the device works as the indicator. When the control outputs are disabled; if key is pressed for 2 seconds *CEnb* is disabled and the device continues to do control function.

### 6. Changing Parameter Values

Keys are pressed together for 2 seconds *LP17* is displayed and the user menu is entered, afterwards first parameter's name is displayed in the user menu.

While a parameter was selected, by pressing to key parameter's value is displayed, the displayed this parameter can be changed with keys. When the parameter name is shown, no action is done after 3 seconds or to the key is pressing again to return to the parameter's name. When the parameter name is shown, keys are pressed together immediately without waiting to get out of this process.

#### Program mode



**7. The Hidden Menu**  
While in the user menu, if key is pressed for 7 seconds the *LP27* message is displayed and is entered the hidden menu. Then *uPL* parameter is displayed. Selected the parameter's value, by pressing the key is displayed and with keys can be changed. Parameter access and saving functions, user menu is like. All parameters can be accessed from this menu.

#### 8. Transferring Parameters Between Menus

If keys are pressed together for 2 seconds; parameter is transferred to the user menu. In this way the user menu up to 8 parameters can be transferred.

In the user menu keys are pressed together along the 2 seconds the parameter is removed from the user menu.

When a parameter is displayed in the user menu °F LED lights up in the hidden menu. If the user menu have not any parameter *nP* message is displayed.

### ERROR MESSAGES

<b>PFR</b>	Means, thermostat probe is broken.	<b>P5C</b>	Means, thermostat probe is short circuit.	<b>PFR2</b>	Means, thermostat probe is broken.
<b>---</b>	Temperature value is higher than the scale.	<b>---</b>	Temperature value is lower than the scale.	<b>P5C2</b>	Means, thermostat probe is short circuit.

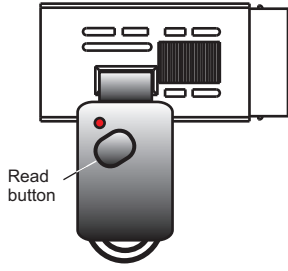
### ALARM SITUATION

<b>WW -24.0 M M M</b>	1. When the alarm situation occurred, the measured value flashes in the indicator and if " <i>LnD</i> " parameter is not "0" is given audible alarm by the device. While there are a audible warning ;  key is pressed, the audible warning will be disabled.
<b>WW ER M M</b>	2. External alarm is activated but output's is not affected by this situation.
<b>WW SR M M</b>	3. Except that the alarm has been activated and external alarm output relay is active when the show shut down. (off situation).

### FACTORY DEFAULTS

If key is held down while the device is powered up, *d.PFR* message will displayed and factory parameters are restored.

## 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, "**5uc**" 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
<b>uPL</b>	The upper limit of the set point	-600	uPL	°C	150
<b>LoL</b>	The lower limit of the set point	LoL	1500	°C	-60
<b>HYS</b>	Switch hysteresis for compressor (hysteresis)	0.1	200	°C	2
<b>oFF</b>	The offset point for the refrigeration	-200	200	°C	0

### CONFIGURATION PARAMETERS

		°C	°F		°C
<b>Unit</b>	Temperature unit (Devices with part code suffix 'F' have deg F as the default 'Unit').	°C	°F		°C
<b>dPnt</b>	Decimal point (no= decimal point isn't shown 22°C, YES=decimal point is shown 22.3°C.)	no	YES		no
<b>d.inP</b>	Digital input types. nd: Digital input unused. ER: External alarm. ER message flashes in the display. Output unchanged. SR: Important external alarm. SR message flashes in the display. Relay output is turned off. HL: Control type. CLYP parameter is changed. (if HE = Lo, if Lo = HE) dF: Defrost operation is started.	nd	dF		nd
<b>ddi</b>	Digital input delay. The period of the digital inputs to be active.	0:00	99:00		0:00
<b>dPo</b>	Digital input polarity. cL = While a digital input contact is closed, it is activated. oP = While a digital input is opened, it is activated.	CL	oP		CL
<b>SLoc</b>	While keylock active, the set value is changed. no: Set value is not changed. YES: Set value is changed.	no	YES		no

### COMPRESSOR PROTECTION PARAMETERS

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

### DEFROST CONTROL PARAMETERS

<b>dSnE</b>	Smart Defrost selection (no: Defrost counter (between 2 defrost duration) decrease irrespective of d.inE status of the compressor. YES: Defrost counter decreases as long as compressor work).	no	YES		no
<b>dEYP</b>	Defrost type selection (ELC: electric defrost (compressor is switched off), GRS: hot gas (compressor is ON))	ELC	GRS		ELC
<b>dStP</b>	Defrost stop temperature (If evaporator temperature is greater than this value, defrost will not work)	-600	1500	°C	20
<b>ddur</b>	Defrost duration (If d.dur=0, automatic and manual defrost are disabled.)	0:00	99:00	min:sec	1:00
<b>d.inE</b>	The time between 2 consecutive defrosts.	1:00	99:00	hr:min	1:00
<b>ddSP</b>	During defrost, display configuration (rE= Real temperature is displayed during defrost. (Lc= The temperature which is measured before defrost is displayed during defrost.	Lc	rE		Lc
<b>ddrE</b>	Delay time for display real temperature after defrost is over.	0:00	99:00	min:sec	1:00
<b>dPon</b>	Defrosting process begins with energy (no=Defrost process doesn't start when, the energy comes. YES=Defrost process starts when the energy comes.)	no	YES		no
<b>ddPo</b>	Delay time for defrosting after power is on.	0:00	99:00	min:sec	1:00
<b>ddrE</b>	Dripping (discharge) time	0:00	99:00	min:sec	2:00

### ALARM CONTROL PARAMETERS

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

### FAN CONTROL PARAMETERS

<b>FLon</b>	Fan operates with thermostat. (no=Fan runs independently from thermostat., YES=Fan operated with thermostat.)	no	YES		YES
<b>FStP</b>	Fan stop temperature.	-600	1500	°C/°F	1
<b>FHYS</b>	Fan differential.	0.1	20.0	°C/°F	2
<b>FcSt</b>	Fan operations when compressor stop. (no= Fan holds its status, YES= Fan stops with compressor.)	no	YES		YES
<b>FdSt</b>	Fan operation during defrost process. (no=Fan holds its status, YES= Fan stops during defrost process.)	no	YES		YES
<b>FPon</b>	Required delay time for fan to be powered up.	00:00	99:00	min:sec	1:00
<b>FStE</b>	Required delay time for fan to be powered up after defrost.	00:00	99:00	min:sec	3:00
<b>Fctr</b>	Fan control depending on room temperature. (no=If evaporator temperature over FStP value, fan does not run. YES=If difference between room temperature and the temperature of the evaporator temperature is below from FStP value, fan stops. If the room temperature and evaporator temperature differences greater than FStP + FHYS, fan runs again.	no	YES		no

### MODBUS COMMUNICATION PARAMETERS

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

**ENDA EDT2423A 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 point	SEt	Read / Write
0001d	0x0001	word	Set point upper limit	uPL	Read / Write
0002d	0x0002	word	Upper level alarm	RuPL	Read / Write
0003d	0x0003	word	Set point lower limit	LoL	Read / Write
0004d	0x0004	word	Lower level alarm	RLoL	Read / Write
0005d	0x0005	word	Offset cooling value	oFF	Read / Write
0006d	0x0006	word	Cooling differential	HYS	Read / Write
0007d	0x0007	word	Alarm differential	RHYS	Read / Write
0008d	0x0008	word	Digital input types .0=nd;1=ER;2=5R;3=dF	Snd	Read / Write
0009d	0x0009	word	Digital input delay	d inP	Read / Write
0010d	0x000A	word	Delay time for the compressor after power is on.	dd i	Read / Write
0011d	0x000B	word	Delay time required for the compressor to restart following a stop.	C.Pon	Read / Write
0012d	0x000C	word	On time for the compressor output in the case of probe failure	C.FoS	Read / Write
0013d	0x000D	word	Off time for the compressor output in the case of probe failure	C.PPn	Read / Write
0014d	0x000E	word	Defrost stop temperature	C.PPF	Read / Write
0015d	0x000F	word	Defrost duration	ddur	Read / Write
0016d	0x0010	word	The time between 2 consecutive defrosts.	d inE	Read / Write
0017d	0x0011	word	Delay time for defrosting after power is on.	ddPo	Read / Write
0018d	0x0012	word	After the cooling process of cooling start-up delay	ddrE	Read / Write
0019d	0x0013	word	Dripping (discharge) time	ddrE	Read / Write
0020d	0x0014	word	Time delay to display alarm message after alarm is on.	RdFL	Read / Write
0021d	0x0015	word	Time delay to display alarm message after power is on.	RdPo	Read / Write
0022d	0x0016	word	Fan stop temperature.	FStP	Read / Write
0023d	0x0017	word	Fan differential.	FhYS	Read / Write
0024d	0x0018	word	Required delay time for fan to be powered up.	F.Pon	Read / Write
0025d	0x0019	word	Required delay time for fan to be powered up after defrost.	F.Std	Read / Write

**1.2 INPUT REGISTERS**

Input Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured ambient, temperature value (°C / °F)	--	Read
0001d	0x0001	word	Measured defrost sensor, temperature value (°C / °F)	--	Read
0002d	0x0002	word	All controls output status	--	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.

\*All outputs will be displayed in the word as compressor (0.bit) defrost (1.bit) fan (2.bit).

**1.3 DISCRATE INPUTS**

Discrete Inputs Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	bit	Compressor output status (0=OFF; 1=ON)	--	Read
0001d	0x0001	bit	Defrost output status (0=OFF; 1=ON)	--	Read
0002d	0x0002	bit	Fan 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	Temperature unit. OFF = °C , ON = °F	Un it	Read / Write
01d	0x01	Bit	Decimal point . OFF=no . ON=YE5	dPnt	Read / Write
02d	0x02	Bit	Digital input polarity. OFF = cL . ON = oP	dPo	Read / Write
03d	0x03	Bit	Smart Defrost selection. OFF = no , ON= YE5	dSnt	Read / Write
04d	0x04	Bit	Defrost type selection OFF = ELc , ON = GR5	dtYP	Read / Write
05d	0x05	Bit	During defrost, display configuration. OFF = Lc , ON = rE	ddSP	Read / Write
06d	0x06	Bit	Defrosting process begins with energy. OFF = no , ON = YE5	dPon	Read / Write
07d	0x07	Bit	Alarm configuration. OFF = Rb5 , ON = Relative alarm rEF	RtYP	Read / Write
08d	0x08	Bit	Fan operates with thermostat. OFF=no , ON=YE5	FCon	Read / Write
09d	0x09	Bit	Fan operations when compressor stop. OFF=no , ON=YE5	FcSt	Read / Write
10d	0x0A	Bit	Fan operation during defrost process. OFF=no , ON=YE5	FdSt	Read / Write
11d	0x0B	Bit	Fan control depending on room temperature. OFF=no , ON=YE5	Fctr	Read / Write
12d	0x0C	Bit	While the keys are locked , set value is adjustable. OFF = no , ON = YP5	SLoc	Read / Write
13d	0x0D	Bit	The keylock active / inactive. OFF= inactive , ON= active	--	Read / Write
14d	0x0E	Bit	Starting manual defrost or stopping manual defrost. OFF= stopping , ON= starting	--	Read / Write
15d	0x0F	Bit	Control outputs active / inactive. OFF= active , ON= inactive	--	Read / Write
16d	0x010	Bit	The factory setting is loaded. ON= The factory setting is loaded.	--	Read / Write

\* For Coil at a time should be maximum 16 bit reading / writing.