



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 limits of the setpoint adjustment.
- * 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 (Optional).
- * 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	2	3

- 1 - Supply Voltage**
230.....230V AC
2424V AC/DC
1212V AC/DC
SM.....9-30V DC/7-24V AC
- 2 - Contact Current Selection**
R.....8A Contact output
P.....20A Contact output
- 3 - ModBus Selection**
RS.....ModBus (Optional)
Blank.....N/A
(Must be specified at order)

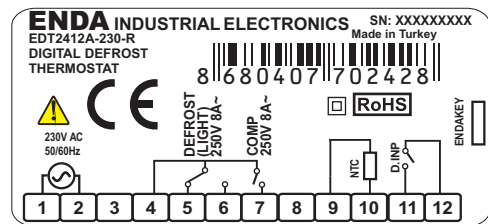


CONNECTION DIAGRAM

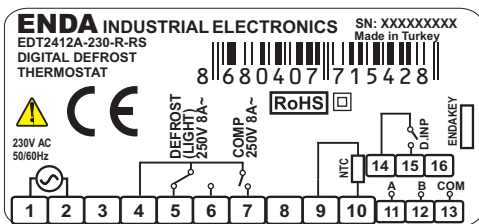


ENDA EDT2412A is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must be carried out by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables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



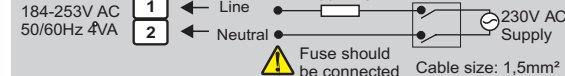
Equipment is protected throughout by **DOUBLE INSULATION**



Holding screw 0.4-0.5Nm.

NOTE:

SUPPLY:



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 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	For EDT2412A-X-R; Relay: NO+NC 250V AC,8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load) For EDT2412A-X-P; Relay: NO 277V AC,20A (for resistive load), 2hp, 1.49kW 250V AC (for inductive load)
Defrosting and lighting relay output	For EDT2412A-X-R; Relay : NO+NC 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load)
Life expectancy for compressor relay output	For EDT2412A-X-R; Without load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching. For EDT2412A-X-P; Without load 10.000.000 switching; 277V AC, 20A (resistive load) 100.000 switching.
Life expectancy for defrosting and lighting relay output	For EDT2412A-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.



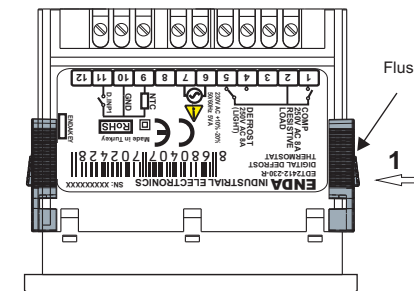
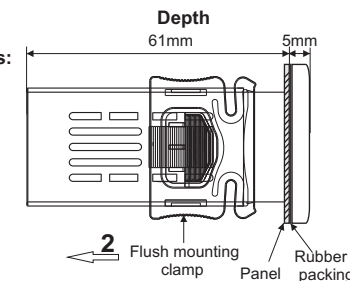
While cleaning the device, solvents (thinner, benzene, acid etc.) or corrosive materials must not be used.

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.



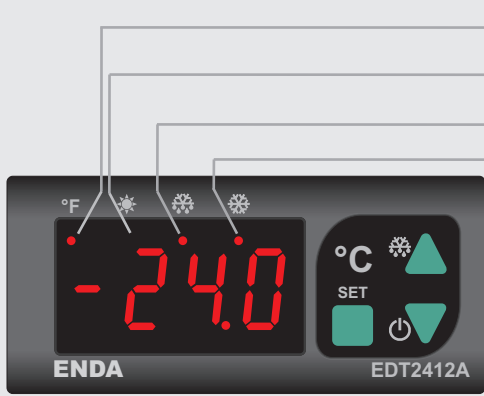
Note:

- 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.



SİSEL MÜHENDİSLİK ELEKTRONİK SAN. VE TİC. A.Ş.
Şerifali Mah. Barbaros Cad. No:18 Y.Üdülulu 34775
ÜMRANİYE/İSTANBUL-TURKEY
Tel : +90 216 499 46 64 Pbx. Fax : +90 216 365 74 01
url : www.enda.com.tr

ENDA™
EDT2412-E-01-151201



- °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.
- LIGHTING LED** : Heating is being checked; while the output is active, the LED lights.
- DEFROST LED** : With the defrost lights up.
- COMPRESSOR LED** : If compressor output is active, this LED lights up. While these compressor delays expected, this LED flashes.
- SET** (Green square icon) : While in the operating mode set value, while in the programming mode shows selected parameter's value.
- (Green up arrow icon) : While in programming mode, provides the transition to the next parameter. If parameter is being adjusted, it increases parameter's value. Constantly holding this key, the parameter value rapidly increases.
- (Green down arrow icon) : While in programming mode, provides the transition to the previous parameter. If parameter is being adjusted, it decreases parameter's value. Constantly holding this key, the parameter value rapidly decreases.

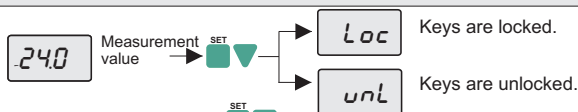
FRONT PANEL COMMANDS

1. Viewing and Changing The Set Value



While in the running mode, if **SET** key is pressed set value is displayed for 3 seconds. While in this case, the set value is changed with **Down/Up** keys.

2. Locking and Unlocking Keys

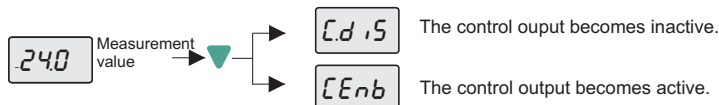


While in the operating mode, if **SET** and **Down** keys are pressed together among 2 seconds the *Loc* message is displayed and the keys are locked. If the keys are locked **SET** and **Down** keys are pressed for 2 seconds again *unL* message is displayed and key lock is opened and is returned to the normal way of working. While keys are locked, if **SET** key is pressed, the set value can be displayed but the value can not be changed. While the keys are locked, **SET** key outside if a key is pressed the *Loc* message is seen.

3. Manuel Defrost Process

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

4. Activating / Inactivating The Control Outputs



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

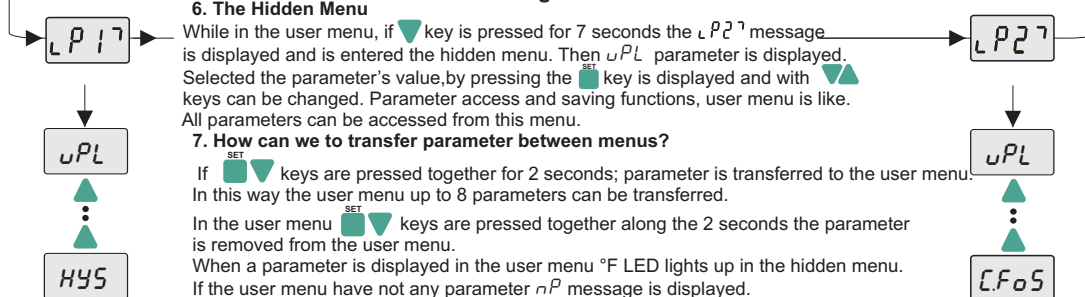
When in the running mode, if **Down** key is pressed for 2 seconds, *C.d iS* message is displayed and control outputs becomes to the inactive position, the device works as the indicator. When the control outputs are disabled; if **Down** key is pressed for 2 seconds *C.Enb* is disabled and the device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

5. Changing Parameter Values

Up/Down keys are pressed together for 2 seconds *L P 1 7* 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 **SET** key parameter's value is displayed, the displayed this parameter can be changed with **Down/Up** keys. When the parameter name is shown, no action is done after 3 seconds or to the **SET** key is pressing again to return to the parameter's name. When the parameter name is shown, **Up/Down** keys are pressed together immediately without waiting to get out of this process.

Program mode



While in the user menu, if **Down** key is pressed for 7 seconds the *L P 2 7* message is displayed and is entered the hidden menu. Then *u P L* parameter is displayed. Selected the parameter's value, by pressing the **SET** key is displayed and with **Down/Up** keys can be changed. Parameter access and saving functions, user menu is like. All parameters can be accessed from this menu.

7. How can we to transfer parameter between menus?

If **SET** and **Down** 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 **SET** and **Down** 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

PFR Means, thermostat probe is broken.

PSC Means, thermostat probe is short circuit.

--- Temperature value is higher than the scale.

--- Temperature value is lower than the scale.

ALARM SITUATION



1. When the alarm situation occurred, the measured value flashes in the indicator and if “*Ln*” parameter is not “0” is given audible alarm by the device. While there are a audible warning; **Up** key is pressed, the audible warning will be disabled.



2. External alarm is activated but output's is not affected by this situation.



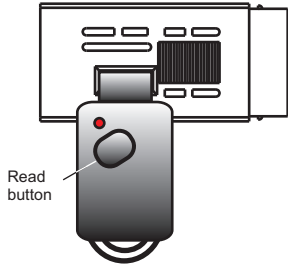
3. Except that the alarm has been activated and external alarm output relay is active when the show shut down. (off situation).

4. Buzzer voice warning is given; if any key is pressed the buzzer will be silenced.

HOW CAN WE RETURN THE DEVICE TO THE FACTORY SETTINGS

Down key is held down while the device is powered up the *d.PFR* message will see and restore the factory parameters.

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, "Errr" message appears. Parameters will not be changed on device.

TRANSFERRING THE PARAMETERS FROM DEVICE TO ENDAKEY

While in "Running Mode", if \blacktriangle 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
uPL	The upper limit of the setpoint	-500	uPL	$^{\circ}C$	150
LoL	The lower limit of the setpoint	LoL	1500	$^{\circ}C$	-60
$HY5$	Switch hysteresis for compressor (hysteresis)	0.1	200	$^{\circ}C$	2
oFF	The offset value for the refrigeration	-200	200	$^{\circ}C$	0

CONFIGURATION PARAMETERS

$oL\ YP$	Defrost / Lighting relay, output type selection. (dEF : Relay is used as defrost relay, $LGht$: Relay is used as lighting relay.)	Co	HE	Co
		dEF	$LGht$	dEF
$Un\ t$	Temperature unit. (Devices with part code suffix 'F' have deg F as the default 'Unit').	$^{\circ}C$	$^{\circ}F$	$^{\circ}C$
$dPnt$	Decimal point (no = decimal point isn't shown $22^{\circ}C$, YES =decimal point is shown $22.3^{\circ}C$.)	no	YES	no
Snd	Type of buzzer sound (6 different voice types can be selected. Alarm during 0 is chosen, the voice warning is canceled.) For Relay-8A is valid.	0	6	0
$d.inP$	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. HC :	nd	dF	nd
$dd\ i$	Digital input delay. The period of the digital inputs to be active.	0:00	99:00	0:00
dPo	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

COMPRESSOR PROTECTION PARAMETERS

$C.Pon$	Delay time for the compressor after power is on.	0:00	99:00	min:sec 1:00
$C.FoS$	Delay time required for the compressor to restart following a stop.	0:00	99:00	min:sec 1:00
$C.PPn$	On time for the compressor output in the case of probe failure.	0:00	99:00	min:sec 0:00
$C.PPF$	Off time for the compressor output in the case of probe failure	0:00	99:00	min:sec 1:00

DEFROST CONTROL PARAMETERS

$dSnt$	Smart Defrost selection (no : Defrost counter (between 2 defrost duration) decrease irrespective of $d.inL$ status of the compressor. YES : Defrost counter decreases as long as compressor work).	no	YES	no
$dL\ YP$	Defros type selection (ELC : electric defrost (compressor is switched off), $GR5$: hot gas (compressor is on))	ELC	$GR5$	ELC
$ddur$	Defrost duration (If $ddur=0$, automatic and manual defrost are disabled.)	0:00	99:00	min:sec 1:00
$d.inL$	The time between 2 consecutive defrosts.	1:00	99:00	hr:min 1:00
$ddSP$	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
$ddrE$	Delay time for display real temperature after defrost is over.	0:00	99:00	min:sec 1:00
$dPon$	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
$ddPo$	Delay time for defrosting after power is on.	0:00	99:00	min:sec 1:00
$ddrt$	Dripping (discharge) time	0:00	99:00	min:sec 2:00

ALARM CONTROL PARAMETERS

$RuPL$	Limit for upper alarm level. When $RtYP$ is changed, $RuPL$ should be readjusted.	$RLoL$	1500	$^{\circ}C$ 150
$RLoL$	Limit for lower alarm level. When $RtYP$ is changed, $RLoL$ should be readjusted.	-500	$RuPL$	$^{\circ}C$ -60
$RHY5$	Hysteresis alarm	0.1	200	$^{\circ}C$ 2
$RtYP$	Alarm configuration. ($Rb5$ = Independent alarm. Alarm values are $RLoL$ and $RuPL$.) (rEF = Relative alarm. Alarm values are $5Et - RLoL$ and $5Et + RuPL$.) NOTE: Upper and Lower alarm level variables are determined according to the "RtYP" parameter. If $RtYP = Rb5$, $RLoL$ and $RuPL$. If $RtYP = rEF$, $LoL = 5Et - RLoL$ and $RuPL$.	$Rb5$	rEF	$Rb5$
$RdFL$	Time delay to display alarm message after alarm is on.	0:00	99:00	min:sec 0:00
$RdPo$	Time delay to display alarm message after power is on.	0:00	99:00	hr:min 0:10

MODBUS COMMUNICATION PARAMETERS

$Rdr5$	Modbus slave device address for device	1	247	1
$bRud$	Modbus communication speed (Baud rate, 0 : oFF , 1 : 1200, 2 : 2400, 3 : 4800, 4 : 9600, 5 : 1920)	oFF	1920	bps 9600

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>ddrE</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>o.tYP</i>	Read / Write
01d	0x01	Bit	Temperature unit. OFF = <i>oC</i> , ON = <i>oF</i>	<i>Un.t</i>	Read / Write
02d	0x02	Bit	Decimal point . OFF= <i>no</i> . ON= <i>YES</i>	<i>d.Pnt</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>d.Snt</i>	Read / Write
05d	0x05	Bit	Defrost type selection OFF = <i>ELC</i> , ON = <i>GRS</i>	<i>d.tYP</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>d.Pon</i>	Read / Write
08d	0x08	Bit	Alarm configuration. OFF = <i>RbS</i> , ON = Relative alarm <i>rEF</i>	<i>R.tYP</i>	Read / Write