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 2 3

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

UV.....90-250V AC (Valid for RS orders)

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

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

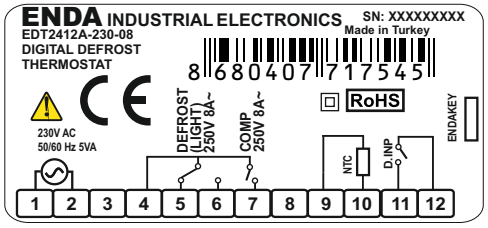
08.....08A Contact output

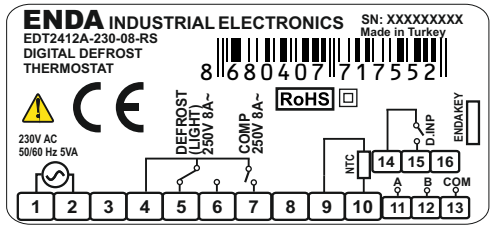
3 - Modbus
RS...Modbus Specified at order)

CE RoHS Compliant

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.

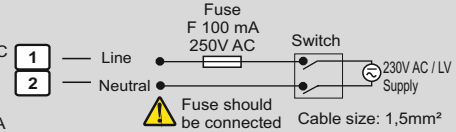




Equipment is protected throughout by **DOUBLE INSULATION**

Holding screw 0.4-0.5Nm.

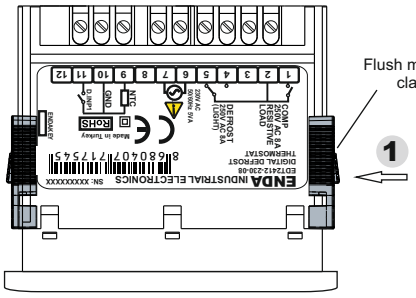
NOTE:
SUPPLY:
184-253V AC veya 10-30V DC/ 8-24V AC 50/60Hz 5VA



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.

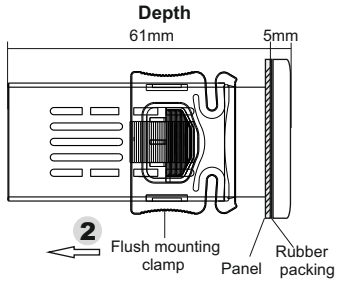
ENVIRONMENTAL CONDITIONS	
Ambient / Storage Temperature	0 ... +50°C/-25 ... 70°C (without icing)
Relative Humidity	Relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
Protection Class	According to EN60529; Front panel : IP65 Rear Panel : IP20
Height	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 +%10-%20, 50/60Hz ; 10-30V DC / 8-24V AC SMPS ; 90-250V AC (Valid for RS orders)
Power Consumption	Max. 5VA
Connection	2.5mm² 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.	

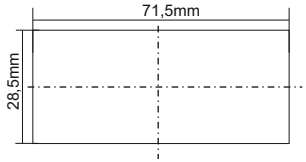
DIMENSIONS



To removing mounting clamps:

- Push the flush-mounting clamp in direction **1** as shown in the figure.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.

Up to date: 03092022, modification reserved and can be change any time previous notice !

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°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

-24.0 (Measurement value) — SET — -30.0 — ▼ — -29.9 — ▲ — -30.0

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

-24.0 (Measurement value) — SET + ▼ — LOC: Locked. / UNL: Unlocked

To locking or unlocking the keypad, SET + ▼ keys are pressed together for 2 seconds. LOC or UNL message will appears for valid status.
During LOC status, just the setpoint value will appear if the SET key is pressed.

3.Manual Defrost Process

Before starting this process, DEF ***must be selected in*** O.TYP ***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*** O.TYP ***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

-24.0 (Measurement value) — ▼ — C.DIS: The control ouput becomes inactive. / C.ENB: The control output becomes active.

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, LP1 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.

Programming Mode

LP1 — UPL — HYS

7. The Hidden Menu

If ▼ is pressed for 7 seconds, LP2 message appears and the hidden menu is entered, and UPL parameter is displayed.
The parameter value can be displayed by pressing SET key and can be changed by using ▼▲ navigation keys.

8. Transferring Parameters Between Menus

By pressing to SET + ▼ keys together for 2 seconds, the parameter can be transferred to user menu. Up to 8 parameters can be transferred.

If SET + ▼ keys are pressed for 2 seconds, parameter will be removed from user menu. During in user menu, °F Led lights up if a parameter is displayed in the hidden menu.
NP message appears if no parameter is stored in the user menu.

LP2 — UPL — C.FOS

ERROR MESSAGES

PFA — No communication with thermostat sensor. (Sensor and/or cable broken or not connected)	PSC — Thermostat probe or connection line short-circuited.
- - - - — Temperature value is higher than the scale.	_ _ _ _ — Temperature value is lower than the scale.

ALARM SITUATION

-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.

EA — **2)** Indicates the external alarm is activated and the outputs are not affected.

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. O.PAR message will be displayed if the operation success.

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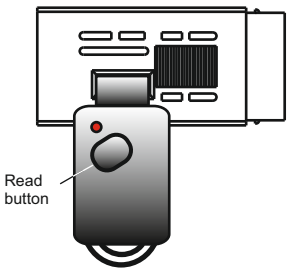
ENDAKEY PARAMETER TRANSFER



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.

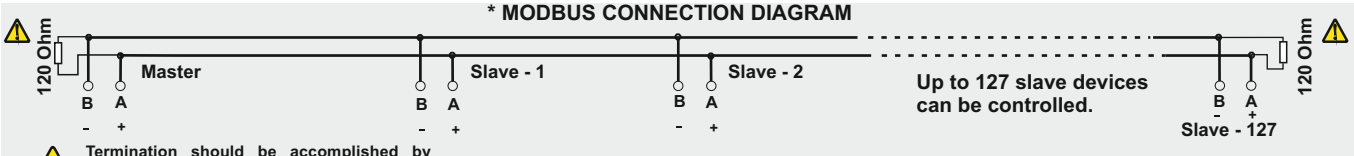
TRANSFERRING THE PARAMETERS FROM DEVICE TO ENDAKEY

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 transfering 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	Upper limit for setpoint value.	-60.0	uPL	°C	150
LoL	Lower limit for setpoint value.	LoL	150.0	°C	-60
HyS	Switch hysteresis for compressor.	0.1	20.0	°C	2
oFF	Offset value for the refrigeration	-20.0	20.0	°C	0
CONFIGURATION PARAMETERS					
o.typ	Defrost / Lighting relay, output type selection. (dEF : Relay is used as defrost relay, LGHT : Relay is used as lighting relay.	dEF	LGHT		dEF
unit	Temperature unit	°C	°F		°C
dpnt	Decimal point (no= No decimal place added ie. 22°C , yES= Decimal place added ie. 22.3°C).	no	yES		no
snd	Buzzer sound type. 6 different sounds can be selected. The alarm will be silent when 0 is selected.	0	6		0
d.inp	Digital input types. no : Digital input not used. Er : External alarm. Er message flashes and the output will not change. SA : Important external alarm. SA message flashes and the relay outputs will be switched off. oF : Defrost operation starts. LGHT : Lightening operation starts.	no	oF		no
doi	Digital input delay. The period of the digital inputs to be active.	0:00	99:00		0:00
dpo	Digital input polarity. CL = Active when digital input contact is closed. OP = Active when digital input contact is open.	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					
d.smt	Smart Defrost selection. no : The defrosting counter is reduced regardless (between 2 defrosting process) the condition of the compressor. yES : The defrosting counter is reduced as long as the compressor is running.	no	yES		no
d.typ	Defros type selection (ELC : electric defrost (compressor is switched off), GAS : hot gas (compressor is on)) ELC		GAS	ELC	
d.dur	Defrost duration (If d.dur parameter is set to no , automatic and manual defrost will be disabled).	0:00	99:00	min:sec	1:00
d.int	The time between 2 consecutive defrosts.	1:00	99:00	hr:min	1:00
d.dsp	Defrost process monitoring configuration. rE = Real temperature is displayed during defrost. Lc = The latest measured temperature value before starting the defrost is displayed. This value remains constant until the defrosting process ends.	Lc.	rE		Lc.
d.dre	Real temperature monitoring delay time at the end of the defrosting process.	0:00	99:00	min:sec	1:00
d.pon	The defrost process starts when power-up (no = No yES = Yes).	no	yES		no
d.dpo	Delay time for defrosting after power is on.	0:00	99:00	min:sec	1:00
d.drt	Dripping (discharge) time	0:00	99:00	min:sec	2:00
ALARM CONTROL PARAMETERS					
A.uPL	Limit for upper alarm level. When A.typ is changed, AuPL should be readjusted.	A.LoL	150.0 °C	150	
A.LoL	Limit for lower alarm level. When A.typ is changed, ALoL should be readjusted.	-60.0	A.uPL	°C	-60
A.HyS	Hysteresis alarm	0.1	20.0	°C	2
A.typ	Alarm configuration. (Abs = Independent alarm. Alarm values are A.LoL and A.uPL .) (rEF = Relative alarm. Alarm values are SEt-A.LoL and SEt+A.uPL.) NOTE: Upper and Lower alarm level variables are determined according to the " A.typ " parameter. If A.typ = A.bS , A.LoL and A.uPL. If A.typ = rEF, LoL = SEt-A.LoL and A.uPL.	Abs	rEF	Abs	
A.dFL	Time delay to display alarm message after alarm is on.	0:00	99:00	min:sec	0:00
A.dpo	Time delay to display alarm message after power is on.	0:00	99:00	hr:min	0:10
MODBUS COMMUNICATION PARAMETERS					
Adrs	Modbus slave device address for device	1	247		1
bAud	Modbus communication speed (Baud rate, 0 : oFF, 1 :1200, 2 : 2400, 3 : 4800, 4 : 9600, 5 :19.20)	oFF	19.20	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	UPL	Read / Write
0002d	0x0002	word	Upper level alarm	A.UPL	Read / Write
0003d	0x0003	word	Set point lower limit	LOL	Read / Write
0004d	0x0004	word	Lower level alarm	A.LOL	Read / Write
0005d	0x0005	word	The offset value for the cooling	OFF	Read / Write
0006d	0x0006	word	Cooling hysteresis	HYS	Read / Write
0007d	0x0007	word	Switch hysteresis for alarm	A.HYS	Read / Write
0008d	0x0008	word	Type of buzzer sound	SNO	Read / Write
0009d	0x0009	word	Digital input types .0=NO;1=ER;2=SA;3=DF;4=LGHT	D.INP	Read / Write
0010d	0x000A	word	Digital input delay	DDI	Read / Write
0011d	0x000B	word	Delay time for the compressor after power is on.	C.PON	Read / Write
0012d	0x000C	word	Delay time required for the compressor to restart following a stop.	C.FOS	Read / Write
0013d	0x000D	word	On time for the compressor output in the case of probe failure	C.PPN	Read / Write
0014d	0x000E	word	Off time for the compressor output in the case of probe failure	C.PPF	Read / Write
0015d	0x000F	word	Defrost duration	D.DUR	Read / Write
0016d	0x0010	word	The time between 2 consecutive defrosts.	D.INT	Read / Write
0017d	0x0011	word	Delay time for defrosting after power is on.	D.DPO	Read / Write
0018d	0x0012	word	After the cooling process of cooling start-up delay	D.DRE	Read / Write
0019d	0x0013	word	Dripping (discharge) time	DDRT	Read / Write
0020d	0x0014	word	Time delay to display alarm message after alarm is on.	A.DFL	Read / Write
0021d	0x0015	word	Time delay to display alarm message after power is on.	A.DPO	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 port 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

Discrate 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 = DEF ON = LGHT	D.TYP	Read / Write
01d	0x01	Bit	Temperature unit. OFF = C , ON = F	UNIT	Read / Write
02d	0x02	Bit	Decimal point . OFF=NO ON=YES	D.PNT	Read / Write
03d	0x03	Bit	Digital input polarity. OFF = CL ON = OP	DPO	Read / Write
04d	0x04	Bit	Smart Defrost selection. OFF = NO , ON= YES	D.SMT	Read / Write
05d	0x05	Bit	Defrost type selection OFF = ELC , ON = GAS	DTYP	Read / Write
06d	0x06	Bit	During defrost, display configuration. OFF = LC , ON = RE	DDSP	Read / Write
07d	0x07	Bit	Defrosting process begins with energy. OFF = NO , ON = YES	DPON	Read / Write
08d	0x08	Bit	Alarm configuration. OFF = ABS , ON = Relative alarm REF	A.TYP	Read / Write

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