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 ET5412 TEMPERATURE CONTROLLER

Thank you for choosing **ENDA ET5412** temperature controller.

- 54x94mm sized.
- On-Off control.
- Relay output selection for cooling or heating control.
- Relay output for Alarm
- Single NTC probe input.
- Offset value can be entered for NTC probe.
- The output state can be set to ON, OFF or Periodical running in case of probe failure.
- Upper and lower limits of the setpoint can be set.
- Upper and lower alarm limits can be set to dependent on the setpoint value.
- Temperature unit can be selected as °C or °F.
- Communication feature over RS485 Modbus protocol (Specify at Order).
- CE marked according to European Norms.

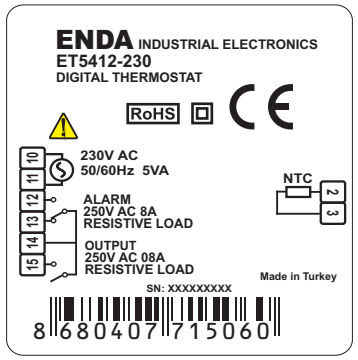
Order Code : ET5412 - □□□ - □□
(1 = □□□, 2 = □□)

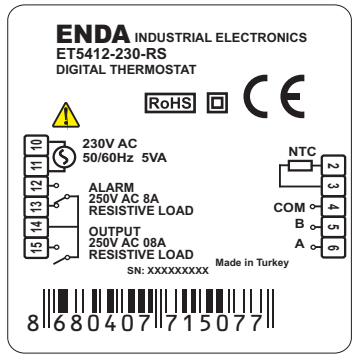
1-Supply Voltage
230.....230V AC
LV..... 10-30V DC / 8-24V AC

2-Modbus
RS...Modbus
(Specify at Order)

CE RoHS Compliant

ENDA ET5412 is a rail mounted device. 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. The 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.

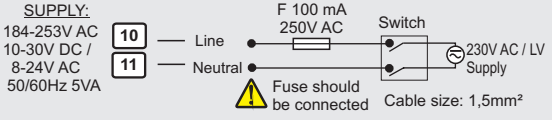




Holding screw 0.4-0.5Nm.

Equipment is protected throughout by **DOUBLE INSULATION**

NOTE:
SUPPLY:
184-253V AC
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	Max. 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.

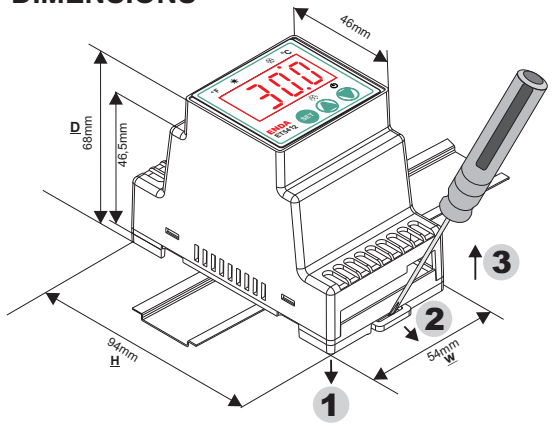
ELECTRICAL CHARACTERISTICS	
Supply voltage	230V AC 50/60Hz; 10-30V DC/8-24V AC SMPS
Power Consumption	Max. 5VA
Connection	2.5mm² screw-terminal connections
Scale	-60.0 ... +150.0°C (-76.0 ... +302.0°F)
Sensitivity	0.1°C (can be set as 0.1ºC or 1ºC.)
Accuracy	±1°C
Time Accuracy	±%1
Display	4 digits, 12.5mm, 7 segment LED
EMC	EN 61326-1: 2013
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

OUTPUTS	
Relay Output	OUTPUT : 250V AC, 8A (for resistive load), NO., Control output. ALARM : 250V AC, 8A (for resistive load), NO.+NC., Control output.
Life Expectancy for Relay	Mechanical 30.000.000; Electrical 300.00operation. 250V AC, 8A (resistive load).

CONTROL	
Control Type	Single set-point control
Control Algorithm	On-Off control
Hysteresis	Adjustable between 1 ... 20.0°C.
HOUSING	
Housing Type	Mounted to TH35 type rail that is in accordance with EN60715 standarts
Dimensions	W54xH94xD68mm
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 mounting the device to the panel;
Push the device in direction 1 , the rails provide the key to keeping the rail.

To removing the device from rail;
Push the rail lock in direction 2 with a screwdriver and pull the device in direction 3 .

sisel
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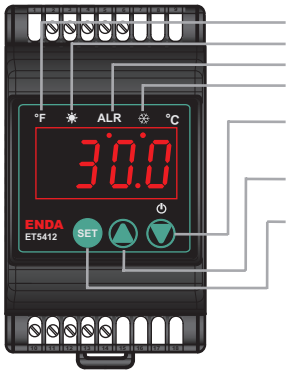
ENDA™

ET5412-EN-02-220103



°F FAHRENHEIT LED : "F" Led lit if the temperature value in Fahrenheit unit.
HEATING LED : Heating LED lit during heating control if the output is active.
ALARM LED : Alarm LED lit if the alarm output is active.
COOLING LED : Cooling LED lit during cooling control if the output is active.

While in "Programming Mode", provides the transiton to the previous parameter. If parameter is being adjusted, it decreases parameter's value. Constantly holding this key, the parameter value rapidly decreases.

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.

SET Provides to display setpoint value, when pressed during "Running Mode".
Provides to display parameter value, when pressed during "Programming Mode".

Running Mode

22.0 **Temperature value** → SET → 45.0 → ▼ → 44.9 → ▲ → 45.0 → SET →

In Running Mode, If SET key is pressed, OUTPUT set value appears, by pressing the ▲▼ keys, desired value can be adjusted.

Programming Mode

By holding down 3 seconds to ▲▼ keys together, "Programming Mode" is entered.
If pressed the keys during the "Programming Mode", "Running Mode" is entered.

- LPI
- uPL — Upper limit setpoint value
- LoL — Lower limit setpoint value
- HYS — Output hysteresis
- oFF — Output offset value
- C.tYP — Control Type (HE = Heating control, Co = Cooling control)
- Unit — Temperature Unit
- d.Pnt — Decimal Point Indication (YES = Indicates as Decimal)
- Ar5t — Alarm relay condition in case of probe failure: no = output OFF, YES = output ON
- AtYP — Alarm type: Abs = Independent Alarm, rEF = Deviation Alarm
- AHYS — Alarm Hysteresis
- ALoL — Alarm setpoint value Lower Limit
- AuPL — Alarm setpoint value Upper Limit
- C.PPF — Output "ON" time duration in case of probe failure
- C.PPn — Output "OFF" time duration in case of probe failure

* Adr5 **Device address.**
* bAUd **Baudrate.**

⚠ **This feature available with Modbus devices only. Described at the end of the order code as with the "RS" addition.**

Locking / Unlocking the Keys

24.0 **Temperature 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.

Activating / Inactivating The Control Outputs

24.0 **Temperature value** → ▼ → C.dIS **The control ouput(s) becomes inactive.** / C.Enb **The control output(s) becomes active.**

C.dIS or C.Enb message will be displayed depends on the current status when pressed the ▼ key for 2 seconds in "Running Mode" and the control output status will be changed to active or inactive.

⚠ C.dIS message appears periodically during "Running Mode" if the control output(s) inactive.

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.

PARAMETER TABLE

LPI	Menu Parameters	Min	Max.	Unit	Start Value
uPL	Upper limit for set value	LoL	150.0	°C	150
LoL	Lower limit for set value	-60.0	uPL	°C	-60
HYS	Hysteresis output differential	0.1	20.0	°C	2
oFF	Output offset value	-20.0	20.0	°C	0
C.tYP	Control type (HEAt = Heating control, Cool = Cooling control).	HEAt	Cool		HEAt
Unit	Temperature Unit	°C	°F	°C	
d.Pnt	Decimal point indication (YES = Indicates as Decimal. 22.3°C) (no = Indicates as Integer numeric (Non-Decimal) 22°C)	no	YES		no
C.PPn	ON Time for the output in case of Probe Failure.	0:00	99:00	min:sec	0:00
C.PPF	OFF Time for the output in case of Probe Failure.	0:00	99:00	min:sec	1:00
AuPL	Upper limit for Alarm set value	ALoL	150.0	°C	150
ALoL	Lower limit for Alarm set value	-60.0	AuPL	°C	-60
AHYS	Hysteresis Alarm differential	0.1	20.0	°C	2
AtYP	Alarm configuration If AtYP = Abs ; ALoL and AuPL If AtYP = rEF ; LoL = SEt - ALoL and AuPL	Abs	rEF		Abs
Ar5t	Alarm relay condition in case of probe failure	no	YES		no
*Adr5	Device address	1	247		1
*bAUd	Baudrate	oFF	19200		9600

ENDA ET5412 DIGITAL THERMOSTAT MODBUS PROTOCOL ADDRESS MAP

1.1 HOLDING REGISTERS

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
0000d	0x0000	word	Set value	--	Readable/Writeable	-20
0001d	0x0001	word	Set point value upper limit	uPL	Readable/Writeable	150
0002d	0x0002	word	Alarm set point value upper limit	AuPL	Readable/Writeable	150
0003d	0x0003	word	Set point value lower limit	LoL	Readable/Writeable	-60
0004d	0x0004	word	Alarm set point value lower limit	ALoL	Readable/Writeable	-60
0005d	0x0005	word	Offset value	oFF	Readable/Writeable	0
0006d	0x0006	word	Output hysteresis	HYS	Readable/Writeable	2
0007d	0x0007	word	Alarm output hysteresis	AHYS	Readable/Writeable	2
0008d	0x0008	word	ON Time for the output in case of Probe Failure.	C.PPn	Readable/Writeable	0:00(0 sec)
0009d	0x0009	word	OFF Time for the output in case of Probe Failure.	C.PPF	Readable/Writeable	1:00(60 sec)
0010d	0x0010	word	Address value	Adr S	Readable/Writeable	1
0011d	0x0011	word	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200)	bAud	Readable/Writeable	9600

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)	--	

Temperature value is read as "Input Register" parameter and this value with decimal part defined as a signed integer. (That is "23.5 ° C" temperature will be at "235" value).

1.3 DISCRETE INPUTS

Discrete Input Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x00	Bit	Control output state (0 = OFF ; 1 = ON)	--	Read only
0001d	0x01	Bit	Alarm output state (0 = OFF ; 1 = ON)	--	Read only

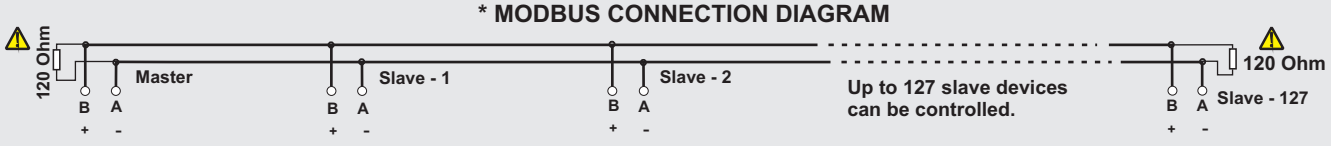
1.4 COILS

Coil Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
00d	0x00	Bit	Control type selection. OFF=Cooling control (Co) ON=Heating control (HE)	C.tYP	Readable/Writeable	Co
01d	0x01	Bit	Temperature unit. OFF = °C , ON = °F	Un it	Readable/Writeable	°C
02d	0x02	Bit	Decimal point . OFF = no , ON = YES	d.Pnt	Readable/Writeable	no
03d	0x03	Bit	Alarm configuration OFF = Abs ON = rEF	AtYP	Readable/Writeable	Abs
04d	0x04	Bit	Alarm relay condition in case of probe failure OFF = no ON = YES	ArSt	Readable/Writeable	no

MODBUS COMMUNICATION PARAMETERS

Adr5	Device address for RS485 network connection. Adjustable between 1-247.	1	247	-	1
bAUd	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200)	oFF	19.20	-	9600

* MODBUS CONNECTION DIAGRAM



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

** Applies to devices with Modbus function.*

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