⚠ 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.

ET5411 TEMPERATURE CONTROLLER

Thank you for choosing **ET5411** temperature controller.

CE

* 54x94mm sized.
* On-Off control.
* Relay output for cooling or heating control.
* Single NTC probe input.
* Offset value can be entered for NTC probe.
* In the case of probe failure, output state can be selected as on, off or periodical running.
* Upper and lower limits of the setpoint can be adjusted.
* Temperature unit can be selected as °C or °F.
* Communication feature over RS485 ModBus protocol (optional).
* CE marked according to European Norms.

R⊕HS Compliant

ORDER CODE : ET5411-☐☐☐ - ☐ - ☐☐
                   1   **2**   **3**

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

2-Output
None.. 8A Relay Output
P....... 20A Relay Output

3-ModBus
RS.......ModBus (Optional)

⚠ **ENDA ET5411** 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.
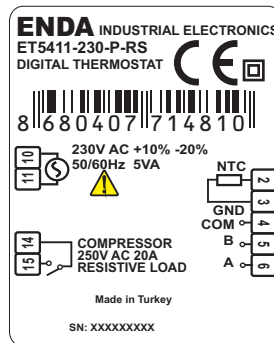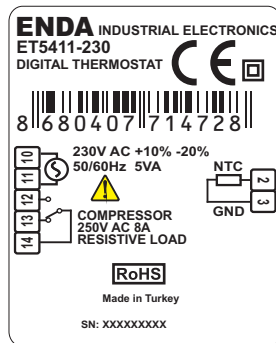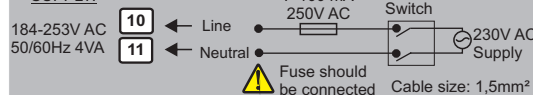
CONNECTION DIAGRAM

▣ **Equipment is protected throughout by DOUBLE INSULATION**

⟳ **Holding screw 0.4-0.5Nm.**

ENDA INDUSTRIAL ELECTRONICS
ET5411-230
DIGITAL THERMOSTAT CE ⊡
8 680407 714728
230V AC +10% -20% 50/60Hz 5VA ⚠ NTC
COMPRESSOR 250V AC 8A RESISTIVE LOAD
GND
RoHS
Made in Turkey
SN: XXXXXXXXX

ENDA INDUSTRIAL ELECTRONICS
ET5411-230-P-RS
DIGITAL THERMOSTAT CE ⊡
8 680407 714810
230V AC +10% -20% 50/60Hz 5VA ⚠ NTC
COMPRESSOR 250V AC 20A RESISTIVE LOAD
GND
COM
B
A
Made in Turkey
SN: XXXXXXXXX

NOTE:
SUPPLY:
184-253V AC 50/60Hz 4VA — **10** ← Line
11 ← Neutral
Fuse F 100 mA 250V AC
Switch
⚠ Fuse should be connected
230V AC Supply
Cable size: 1,5mm²

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

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

ELECTRICAL CHARACTERISTICS

Supply voltage	230V AC +%10 -%20, 50/60Hz or 12/24 V AC/DC ± %10
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 chosen as 0.1ºC or 1ºC.)
Accuracy	±1°C
Time accuracy	±%1
Display	4 digits, 12.5mm, 7 segment LED
EMC	EN 61326-1: 2012
Safety requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

OUTPUTS

Relay output	For ET5411-X-X ; Relay: NO+NC 250V AC, 8A (for resistive load), 1/2hp 240V AC (for inductive load) For ET5411-X-P ; Relay: NO 277V AC, 20A (for resistive load), 2hp 250V AC (for inductive load)
Life expectancy for relay	For ET5411-X-X ; Without load 30.000.000 mechanical; 250V AC, 8A resistive load 100.000 electrical operation. For ET5411-X-P ; Without load 10.000.000 switching; 277V AC, 20A (for resistive load) 100.000 electrical operation.

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.

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

DIMENSIONS

46mm
68mm
46,5mm
94mm
54mm
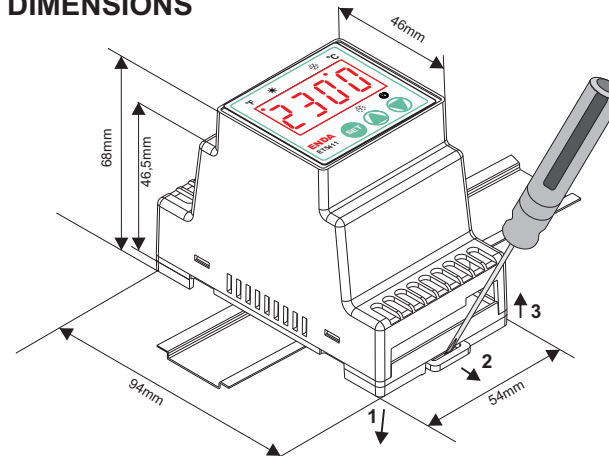
For mounting the device to the panel;
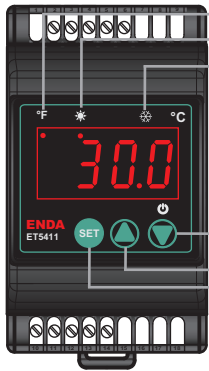Push the device in direction **1** , the rails provide the key to keeping the rail.

For removing the device from rail;
Push the rail lock in direction **2** with a screwdriver and pull the device in direction **3**.
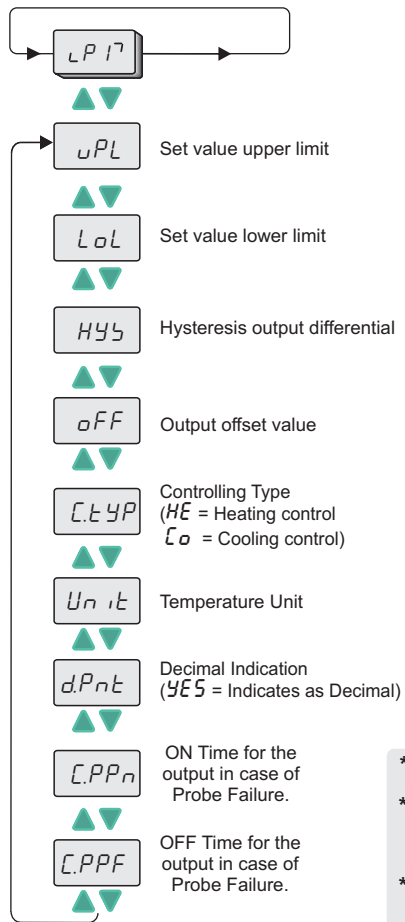
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ET5411-E-01-201412

°F **FAHRENHEIT LED :** In parameter value or the measured temperature value "**F**" unit while this LED lights up.
☀ **HEATING LED** : Heating is being checked; while the output is active, the LED lights.
❄ **COOLING LED** : If compressor output is active, this LED lights up.

▼ 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.

▲ 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 While in the operating mode set value, while in the programming mode shows selected parameter's value.

If ▲▼ keys are held down for 3 seconds, Programming Mode is entered.

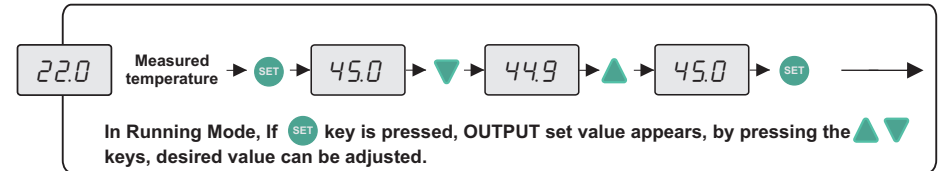**If ▲▼ keys are pressed, Running Mode is entered.**
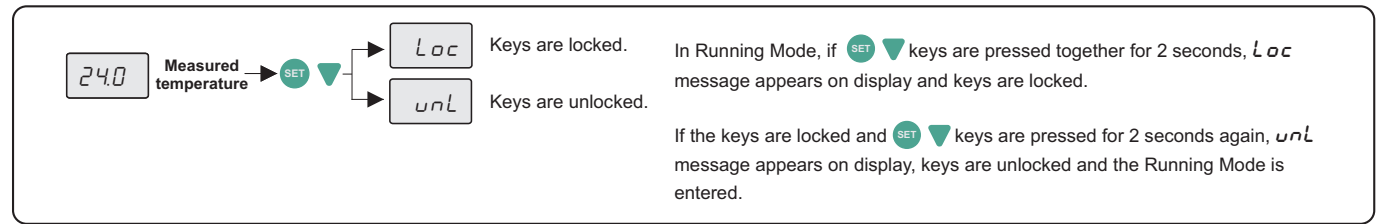
Running Mode

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

Programming Mode

_LP l⁷_

uPL — Set value upper limit

LoL — Set value lower limit

HYS — Hysteresis output differential

oFF — Output offset value

C.tYP — Controlling Type
(HE = Heating control
Co = Cooling control)

Un it — Temperature Unit

d.Pnt — Decimal Indication
(YES = Indicates as Decimal)

C.PPn — ON Time for the output in case of Probe Failure.

C.PPF — OFF Time for the output in case of Probe Failure.

* Available for RS featured devices.

* AdrS — Device address

* bAUd — Baudrate

⚠

Locking - Unlocking Keys

Loc — Keys are locked.
unL — Keys are unlocked.

In Running Mode, if SET ▼ keys are pressed together for 2 seconds, _Loc_ message appears on display and keys are locked.

If the keys are locked and SET ▼ keys are pressed for 2 seconds again, _unL_ message appears on display, keys are unlocked and the Running Mode is entered.

Activating / Inactivating Control Outputs

C.diS — Control outputs disabled.
C.Enb — Control outputs enabled.

⚠ **In Running Mode, if the control outputs are disabled, _oFF_ message periodically appears on display.**

In Running Mode, if ▼ key is pressed for 2 seconds, _C.diS_ / _C.Enb_ message appears on display and control outputs would be disable / enable.

Error Messages

PSC — Sensor short circuited

PFA — Sensor broken or no connection

- - - - — Temperature value is higher than the scale

- - - - — Temperature value is lower than the scale

PARAMETER TABLE

_LP l⁷_	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
Un it	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
* AdrS	Device address	1	247		1
* bAUd	Baudrate	oFF	19200		9600

ENDA ET5411 DIGITAL THERMOSTAT MODBUS PROTOCOL ADDRESS MAP

1.1 HOLDING REGISTERS

Holding Register Addresses Decimal	Hex	Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
0000d	0x0000	word	Set value	--	Readable/Writeable	45
0001d	0x0001	word	Set point upper limit	uPL	Readable/Writeable	150
0003d	0x0003	word	Set point lower limit	LoL	Readable/Writeable	-60
0005d	0x0005	word	The offset value for the cooling	oFF	Readable/Writeable	0
0013d	0x000D	word	ON Time for the output in case of Probe Failure.	C.PPn	Readable/Writeable	0:00 (0 sec)
0014d	0x000E	word	OFF Time for the output in case of Probe Failure.	C.PPF	Readable/Writeable	1:00 (60 sec)

1.2 INPUT REGISTERS

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

1.4 COILS

Coil Addresses Decimal	Hex	Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
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	Unit	Readable/Writeable	°C
02d	0x02	Bit	Decimal point . OFF = no , ON = YES	d.Pnt	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

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