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 ET2413K DIGITAL THERMOSTAT

Thank you for choosing **ENDA ET2413K** incubator temperature controller devices.


- 35x77mm sized
- On-Off control.
- Relay output for heating operation
- Single NTC probe input
- Offset value can be adjusted for NTC input
- Upper and Lower setpoint value limits can be adjusted.
- Rotation duration and intervals can be adjusted
- Manuel process feature
- Humidity duration and intervals can be adjusted
- Temperature unit can be selected °C or °F.
- Transfer device parameter settings with ENDAKEY
  - No power-up required
- RS485 ModBus protocol communication feature (optional)
- CE marked according to European Norms.

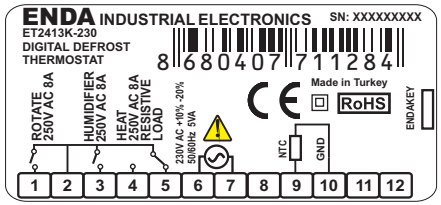
**Order Code : ET2413K** □□□ - □□ (1 - 2)

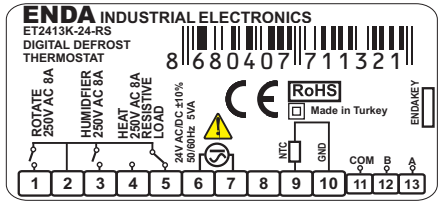
**1 - Supply Voltage**
230.....230V AC
24 .....24V AC/DC
12 .....12V AC/DC

**2 - ModBus (Optional)**
RS.....ModBus
Blank.....N/A

**RoHS Compliant**

**ENDA ET2413K** 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.

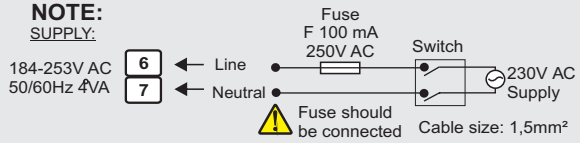



Equipment is protected throughout by **DOUBLE INSULATION**

Holding screw
0.4-0.5Nm.

**NOTE:**
SUPPLY:



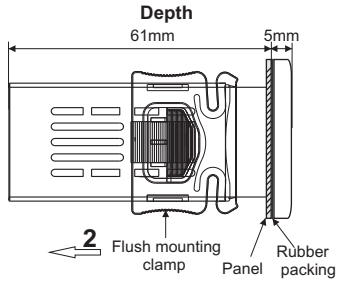

**Note:**
**1)** Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
**2)** In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

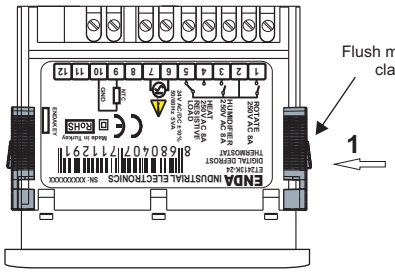
| ENVIRONMENTAL CONDITIONS | |
|---|---|
| **Ambient / Storage Temperature** | 0 ... +50°C/-25 ... 70°C (without icing) |
| **Relative Humidity** | Relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C. |
| **Protection class** | According to EN60529; Front panel : IP65<br>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** | 2.5mm² screw-terminal connections |
| **Scale** | -60.0 ... +150.0°C (-76.0 ... +302.0°F) |
| **Sensitivity** | 0.1°C (Can be selected 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** | |
| **Heat Relay Output** | NO+NC 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load) |
| **Rotation Relay Output** | NO 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load) |
| **Humidification Relay Output** | NO 250V AC, 8A (for resistive load), 1/2hp, 0.37kW 240V AC (for inductive load) |
| **LIFE EXPECTANCY FOR RELAYS** | |
| **Heat Relay** | Without load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching. |
| **Rotation Relay** | Without load 30.000.000 switching; 250V AC, 8A (resistive load) 100.000 switching. |
| **Humidification Relay** | 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, gasoline, acid etc.) or corrosive materials must not be used.** | |

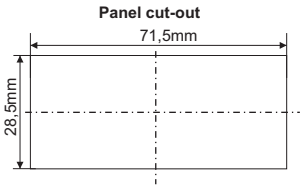
## DIMENSIONS


**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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°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.

RH **HUMIDIFIER LED :** Lights up while humidifying process.

**ROTATION LED :** Lights up while rotating process.

**HEAT LED :** Lights up while heating (heat output is active).

SET In "Running Mode", indicates the set value.
In "Programming Mode", indicates the selected parameter value.

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.

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.

## FRONT PANEL COMMANDS

### 1. Viewing and Changing The Set Value

24.0 Measurement value → SET → 30.0 → ▼ → 29.9 → ▲ → 30.0

While in "Running Mode", if SET key is pressed set value is displayed for 3 seconds. While in this case, the set value is changed with ▼▲ keys.

### 2. Locking and Unlocking Keys

24.0 Measurement value → SET ▼ → Loc Keys are locked.
→ unL Keys are unlocked.

While in "Running Mode", if SET ▼ keys are pressed together for 2 seconds, Loc message is displayed and the keys are locked. If the keys are locked SET ▼ keys are pressed for 2 seconds again, unL message is displayed and keys are unlocked. While keys are locked and if SET key is pressed, set value can be displayed but can not be changed. While the keys are locked and if any key is pressed **( except** SET **key )**, Loc message appears.

### 3. Manuel Rotating Process

While in the "Running Mode", if ▲ key is pressed for 2 seconds, defrost process starts manually. If r.dur parameter is 0 , manual defrost will be inactive.

### 4. Activating / Inactivating The Control Outputs

24.0 Measurement value → ▼ → C.dIS The control ouput becomes inactive.
→ CEnb The control output becomes active.

When in the "Running mode", if ▼ key is pressed for 2 seconds, C.dIS 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 C.Enb is disabled and the device continues to control function.

### 5. Changing Parameter Values

If ▲ ▼ keys are pressed together for 2 seconds "User Menu" is entered, then first parameter's name is displayed in the user menu.

While a parameter is selected, by pressing SET key, parameter value can be displayed. This parameter can be changed with ▼▲ keys. If no operation performed for 3 seconds or during this time, SET key is pressed while parameter value displayed, parameter name will be displayed again. While parameter name displayed, if by pressing together ▼▲ keys, "Running Mode" is entered.

## ERROR MESSAGES

| | | | |
|---|---|---|---|
| PFA | NTC probe is broken or not connected. | PSC | NCT probe is short circuit. |
| ---- | Temperature value is higher than the scale. | ____ | Temperature value is lower than the scale. |

## FACTORY SETTINGS

If ▼ key is held down while the device is powered up, d.PAr message appears and factory parameters restored.

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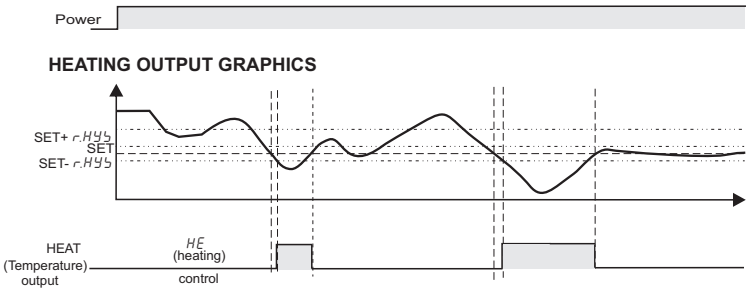
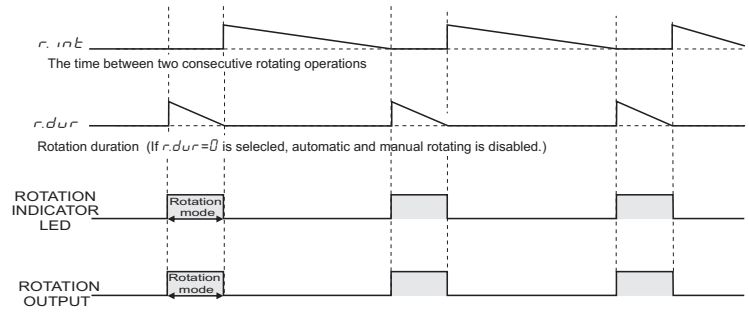
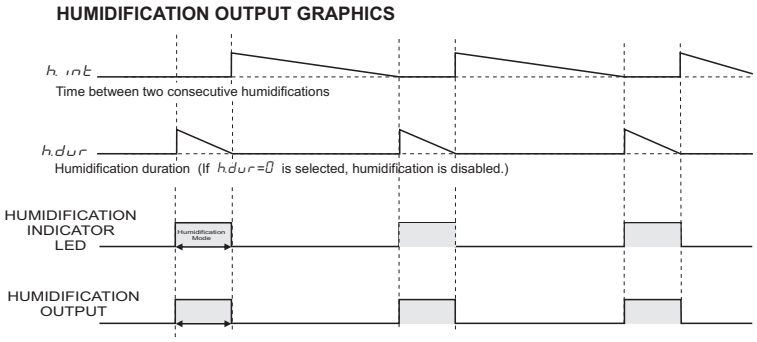
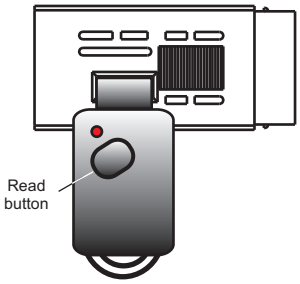
ET2413K-EN-01-170327

## OUTPUT GRAPHICS




### 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. While " dL " message displayed on device and if ▼ key is pressed, parameter values from "ENDAKEY" 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 failure, " Err " message appears and 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 ▲ key is pressed again, parameters are read and transferred to the device. If process succes, " Suc " message appears. In case of failure, " Err " message displayed and 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 | DEFAULT VALUE |
|---|---|---|---|---|---|
| uPL | Upper limit for setpoint | LoL | 150.0 | °C | 150 |
| LoL | Lower limit for setpoint | -60.0 | uPL | °C | -60 |
| HYS | Heating differential (hysteresis) | 0.1 | 20.0 | °C | 2 |
| oFF | Offset value for heating | -20.0 | 20.0 | °C | 0 |
| **CONFIGURATION PARAMETERS** | | | | | |
| Unit | Temperature unit | °C | °F | | °C |
| dPnt | Decimal point (no= decimal point isn't shown 22°C, YES=decimal point is shown 22.3°C.) | no | YES | | YES |
| **ROTATION CONTROL PARAMETERS** | | | | | |
| r.dur | Rotating duration ( If r.dur = 0 selected, automatic and manual rotation is disabled ). | 0:00 | 99:00 | min:sec | 1:00 |
| r. int | Time between 2 consecutive rotation. | 0:00 | 99:00 | hr:min | 1:00 |
| **HUMIDIFICATION CONTROL PARAMETERS** | | | | | |
| h.dur | Humidification duration ( If h.dur = 0 selected, automatic and manual humidification is disabled ). | 0:00 | 99:00 | min:sec | 1:00 |
| h. int | Time between 2 consecutive humidification. | 0:00 | 99:00 | hr:min | 1:00 |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