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 ET401 PID TEMPERATURE CONTROLLER

Thank you for choosing **ENDA ET401** Temperature Controller Devices.

- 48x48mm Sized.
- 14.2mm Led display.
- Selectable thermocouple types.
- Auto calculation for PID parameters (SELF TUNE).
  - **Self tune for automatic PID calculation or manually enter PID parameters if known.**
- Soft-Start feature.
- Single SSR control selection.
- Programmable digital control input.
- Dual temperature setpoint value can be set.
- Zero point input shift.
- SSR output state can be selected or periodically operated in case of probe failure.
- CE marked according to European Norms.

Order Code : ET401 - ☐☐☐

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

CE RoHS Compliant

TECHNICAL SPECIFICATIONS

Input Type		Temperature Range °C	Temperature Range °F	Accuracy
J (Fe-CuNi) Termokupl	EN 60584	-30....600°C	-22....999 °F	± 0,5% (of full scale) ± 1 digit
K (NiCr-Ni) Termokupl	EN 60584	-30....999°C	-22....999°F	± 0,5% (of full scale) ± 1 digit
L (Fe-CuNi) Termokupl	DIN 43710	-30....600°C	-22....999°F	± 0,5% (of full scale) ± 1 digit

ENVIRONMENTAL CONDITIONS	
Ambient/storage Temperature	0 ... +50°C/-25... +70°C (with no icing)
Max. Relative Humidity	Relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
Rated Pollution Degree	According to EN 60529 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	230V AC +%10-%20 50/60Hz ;10-30V DC / 8-24V AC SMPS
Power Consumption	Max. 5VA
Wiring	Power connector: 2.5mm²' screw-terminal, Signal connector: 1,5mm² screw-terminal conenction.
Line Resistance	Max. 100Ω
Data Retention	EEPROM (minimum 10 years)
EMC	EN 61326-1: 2013 (Performance criterion B is satisfied for EN 61000-4-3)
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

CONTROL OUTPUT	
SSR Output	Max 20mA 12Volt logic control output.

CONTROL	
Control Type	Dual setpoint selection
Control Algorithm	On-Off / P, PI, PD, PID (selectable)
A/D Converter	12 bit
Sampling Time	100ms
Proportional Band	Adjustable between 0% and 100% (If Pb parameter is set to 0, On / Off control is applied).
Control Period	Adjustable between 1 and 125 seconds
Hysteresis	Adjustable between 1 and 50°C/F
Output Power	The ratio in setpoint value can be adjusted between 0% and 100%.

HOUSING	
Housing Type	Suitable for flush-panel mounting according to DIN 43 700.
Dimensions	W48xH48xD53mm
Weight	Approx. 230g (after packing)
Enclosure Material	Self extinguishing plastics.

Avoid any liquid contact when the device is switched on.
DO NOT clean the device with solvent (thinner, gasoline, acid etc.) and / or abrasive cleaning agents

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

Running Mode

If SET / AT key is pressed for 1 second, → Please see Diagram.1

Control setpoint settings entered.

By pressing PRG key once, quick settings mode is entered.

If pressed for 2 seconds, "Programming Mode" is entered.

3 saniye hiç bir tusa basilmazsa

Entering from the Programming Mode to the Run Mode:

If no key is pressed in 20 seconds during the "Programming Mode", the data is stored and the "Running Mode" is entered.

Alternatively, the same function occurs first pressing SET / AT key for 2 seconds, "Programming Mode" is entered.

Then PRG key is pressing 2 seconds, data is stored and the "Running Mode" is entered.

If PRG key is pressed for 2 seconds, "Running Mode" is entered.

If pressed for 2 seconds, "Running Mode" is entered.

If pressed for 2 seconds, "Running Mode" is entered.

- C.SL = SSR output control setpoint lower limit. Adjustable between 0 and C.SU parameter value.
- C.SU = SSR output control setpoint upper limit. Adjustable between C.SL parameter value and upper scale value.
- C.Pb = SSR output proportional band value. Adjustable between %0.0 and %100.0. If C. Pb = %0.0, On-Off control is applied.
- C.HY = SSR output hysteresis value. Adjustable between 1 and 50 °C. ⚠ If C.Pb parameter is selected 0, this parameter will be active.
- C.t i = SSR output integral time value. Adjustable between 0.0 and 50.0 minutes. If C.t i = 0.0, integral impact is disable. ⚠ If C.Pb parameter is different from "0", this parameter will be active.
- C.t d = SSR output derivative time value. Asjustable between 0.00 and 9.99 minutes. If C.t d = 0.0, derivative time is disable. ⚠ If C.Pb parameter is different from"0",this parameter will be active.
- C.C.t = SSR output period time. Adjustable between 1 and 125 second. ⚠ If C.Pb parameter is different is different from"0", this parameter will be active.
- C.P.S = SSR ratio of output power percentage at SSR setpoint value. Adjustable between 0% and 100%.
- C.E.P = Incase of sensor failure SSR output power percentage can be adjusted between 0% and 100%. If C.Pb = 0.0 (On/Off control) and If C.E.P = 0 , incase of failure output is OFF. If the parameter is different from 0, incase of failure output is ON.
- S.S.t = Soft starter timer set value. This parameter indicates the time to reach set point value when the device is first energised. Adjustable between 0 and 250 minutes. If 0 is selected, soft start feature will be enable and the device reaches set point value quickly. ⚠ Setting Pb = 0, soft start feature will be disabled.

- A.t u = Automatic PID calculation (Self Tune) parameter. on = Auto calculation ON. oFF = Auto calculation OFF.
- inP = Probe input type section. J = J Type, K = K Type, L = L Type,
- Un i = Temperature unit value. °C = °C, °F = °F. ⚠ (This parameter change, causes some parameters to change).
- C.t.P = Control type selection. HEA = Heating selection (Above the set value; "OFF") CoL = Cooling selection (Above the set value; "ON")
- F.L.t = Digital filter coefficients. Enables filtering the measured value. Adjustable between 1 and 200. If this parameter is 1, digital filter runs most quick. If the parameter is 200, the filter runs most slow. The value of parameter should be increased in interference.
- d.i.S = dSE = Digital input selection. C2S = C/A2 (Relay) out selection SSr = SSR out selection
- oFS = Zero point input shift (Offset) value. Zero point input shift value is added to the measuring value. This feature which is the point of measurement due to its distance measurement probe, is used to eliminate errors that might occur. Adjustable between -99 and 100°C. Normal value=0.

STARTING SELF TUNE

Running Mode

If the A.t u. parameter is on and if, SET / AT key is pressed for 3 seconds in Running Mode, self tune starts automatically.

if the temperature is not high, A.t u. message flashes on display and self tune process starts automatically. If the initial temperature is higher to self tune, E.H i. message appears and the device waits until the temperature goes down. Then A.t u. message appears and automatically self tune procedure is starts. After the self tune procedure, C.Pb, C.t i, C.dt and C.C.t. values are recorded in memory, then the device returns to Run Mode.

STOPPING SELF TUNE

The self-tune process can be terminated by pressing to SET / AT key for 2 seconds.

- S.C.d = Security menu access code. Security parameter 401 must be entered.

Factory Defaults

Press PRG key while S.C.d displaying, Set the S.C.d parameter to 0, and pres PRG key for 4 seconds. d.Pr. message appears on the display and factory defaults will be applied.

- Co.S. = Co.o. menu security, access level parameter. non. = Menu invisible. PUE. = Modification can be performed. Pro = Only visible.
- Cn.S. = CnF. menu security, access level parameter. non. = Menu invisible. PUE. = Modification can be performed. Pro = Only visible.

SENSOR ERROR MESSAGE

C.E.P. parameter appears (as error output percentage) on display in sensor fail condition.

Once pressed PRG key, C.E.P. value flashes on display.

The requested value can be set by using SET / AT PRG navigation keys.

If no operation is performed in 3 seconds, returns to the "Running Mode".

Parameter Setting Diagram

If wait for 3 seconds without pressing any key, returns to the parameter display.

While C.HY parameter seen, if PRG button is pressed and released, the selected parameter value flashes and pass to parameter setting status. In this case, parameter is set to the desired value with SET / AT PRG keys.

If SET / AT key is pressed and held 0.6 seconds, the value of the selected parameter increases rapidly. If waited enough,the value increases a hundred at each step. After 1 second, following the release of the key, initial increasing condition is returned. Same procedure is valid for the decrementing.

Diyagram.1 CONTROL SETPOINT SETTINGS

Running Mode

By pressing to SET / AT key for 1 second, "Control Set1" and "Control Set2" settings entered.

If no operation performed in 5 seconds or by pressed to SET / AT key for 2 seconds the latest change(s) (if any) stored and returned to the "Running Mode".

If no operation performed in 3 seconds

If no operation performed in 3 seconds

TERMS

(1) Measurement value indicator (Running Mode).
Parameter name and indicator (Programming Mode).

(2) Output state indicators.

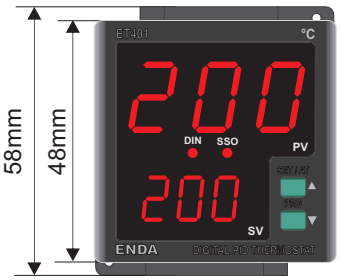
(3) Set value indicator (Running Mode).
Parameter value indicator (Programming Mode).

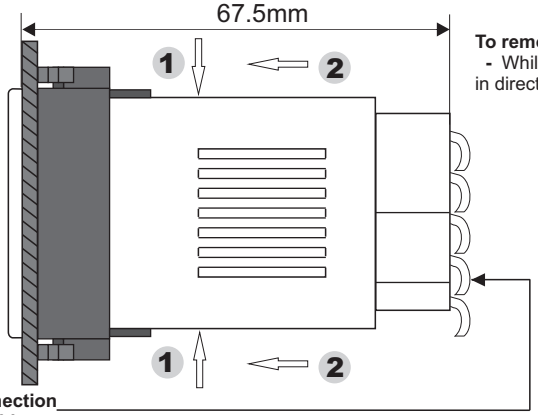
(4) Control setpoint input adjustment and self tune key (Running Mode).
Parameter selection key (Programming Mode).
Value increment key (Running Mode and Programming Mode).

(5) Programming Mode enter key (Running Mode).
Menu selection key (Programming Mode).
Parameter setting transition key (Programming Mode).
Value decrement key (Running Mode and Programming Mode).

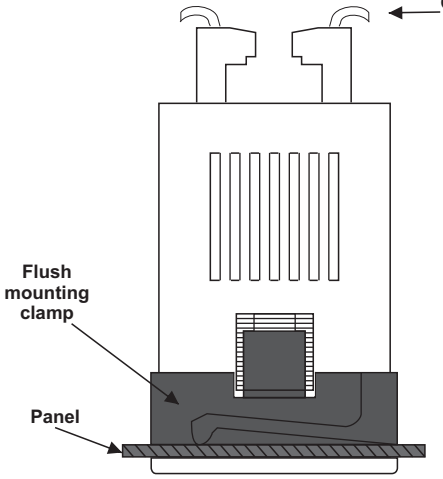
(1),(3) PV and SV indicator	PV 7 Segment 3 digits red, SV 7 segment 3 digits red LED display
Character heights	PV indicator : 14.2mm, SV indicator : 9.1 mm
(4), (5) Keypad	Mikro switch
(2) State indicators	2 Red LEDs for Digital input and SSR outputs

DIMENSIONS

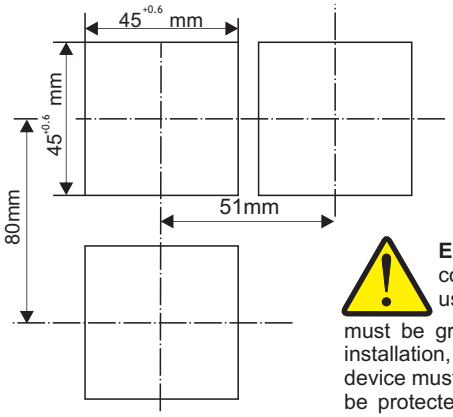




To removing the device from the panel :
- While pressing both side of the device in direction **1** and push it in direction **2** .

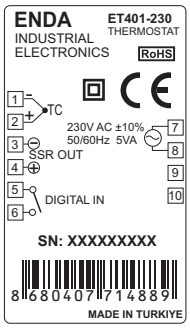


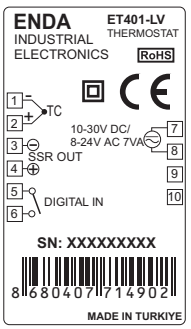
PANEL CUT-OUT



Note :
1) While panel mounting, additional distance required for connection cables should be considered.
2) Panel thickness should be 9mm maximum.
3) If there is no free space at back side of the device, it would be difficult to remove it from the panel. 100mm clearance should be left behind the device.

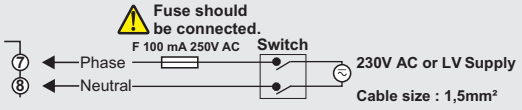
CONNECTION DIAGRAM



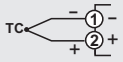


NOTE :

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



SENSOR INPUT:
For Thermocouple :
Use the correct compensating cable. Do not make any supplement to cables. Connect the thermocouple cables to the right places at the input terminal



ENDA ET401 is intended for installation within control panels. Make sure that the device is used only for intended purpose. The shielding must be grounded on the instrument side. 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. Make sure that the operation temperature is not exceeded. All input and output lines that are not connected to the supply network must be laid out as shielded and twisted cables. These cables should not be close to the power cables or components. The installation and electrical connections must be carried out by a qualified staff and must be according to the relevant locally applicable regulations.

Logic output of the device is not electrically isolated. Therefore, if the grounded thermocouple is used, logic outputs of the device should not be grounded.

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.

Holding screw 0.4-0.5Nm.

Equipment is protected throughout by DOUBLE INSULATION