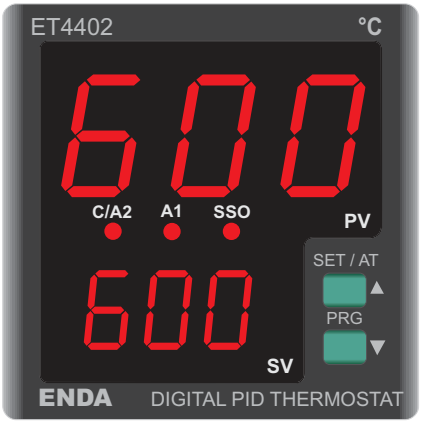
Read this document carefully before using this device. The guarantee will be expired by device demages if you don't attend to the directions in user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

ENDA ET4402 PID TEMPERATURE CONTROLLER

Thank you for choosing **ENDA ET4402** temperature controller.

- 48 x 48mm sized.
- 14.2 mm Led display.
- Selectable thermocouple types.
- Automatic calculation of PID parameters (Self Tune).
  - Self tune for automatic PID calculation or manually enter PID parameters if known.
- Soft-Start feature.
- Selectabe SSR control output.
- C/A2 Relay output can be set as secondary alarm or temperature control.
- A1 Relay output can be used as primary alarm.
- Zero point input shift.
- In case of sensor failure, periodically, auto-periodically running or relay state can be selected.
- CE marked according to European Norms.



Order Code : ET4402 - ☐☐☐
1

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. 100ohm
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)

OUTPUTS	
C/A2 output	Relay : 250V AC, 5A (for resistive load), Selectable as NO. Control or Alarm2 output.
A1 output	Relay : 250V AC, 5A (for resistive load), Selectable as NO. Alarm1 and Cooling Control.
SSR output	Max 20mA 12Volt logic control output.
Life expectancy for relay	5.000.000 Switching for no-load operation; 200.000 switching for 5A resistive load at 250VAC.

CONTROL	
Control type	Single set-point and alarm control
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=0%, On-Off control is selected.
Control period	Adjustable between 1 and 125 seconds
Hysteresis	Adjustable between 1 and 50°C/F
Output power	The ratio of power at a set point 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 while 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

SET / AT

If SET / AT key is pressed for 1 second continuously, Control and Alarm setpoint setting is entered.

See page 3

PRG

If this key is pressed once, quick setpoint adjustment can be performed. Adjusted value flashes on display.

PRG

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

If no key pressed in 3 seconds, "Running Mode" is entered.

To access "Running Mode" :

If no key is pressed for 20 seconds, the adjusted value (if any) stored and "Running Mode" is entered.
Or if the SET / AT key is pressed for 2 seconds, the main menu is entered then by pressed to PRG key before expired 20 seconds, "Running Mode" is entered.

PRG

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

C.o. — If pressed for 2 seconds continuously, Running Mode is entered.

- **C.SL = C/A2 Output Control Setpoint Lower Limit.** Can be adjusted between 0 and C.SU parameter value.
- **C.SU= C/A2 Output Control Setpoint Upper limit.** Can be adjusted between C.SL. parameter value and upper scale value.
- **C.Pb. = C/A2 Output Proportional Band Value.** Can be adjusted between %0.0 and %100.0. If C. Pb = %0.0, On-Off control is selected.
- **C.HY = C/A2 Output Hysteresis Value.** Can be adjusted between 1 and 50 °C. ⚠ If C.Pb. parameter is set to 0, this parameter will be activated.
- **C.t i = C/A2 Output Integral Time Value.** Can be adjusted between 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.td = C/A2 Output Derivative Time Value.** Can be asjusted between 0.00 and 9.99minutes. If C.td = 0.0, derivative time is disable. ⚠ If C.Pb. parameter is different from"0",this parameter will be activated.
- **C.Ct. = C/A2 Output Period Duration.** Can be adjusted between 1 and 125 seconds. ⚠ If C.Pb. parameter is different from"0", this parameter will be activated.
- **C.Ps = C/A1 Output Power Percentage at C/A2 Setpoint Value.** Can be adjusted between %0 and %100. ⚠ If C.Pb. parameter is different form "0", this parameter will be activated.
- **C.EP. = Output Power Percentage In Case of Sensor Failure.** Can be adjusted between %0 and %100. ⚠ The following conditions occur when the C.Pb parameter is set to 0.0 (ON/OFF control). The output will be OFF in error condition if the C.EP parameter is set to 0. The output will be ON in error condition if the C.EP parameter is set to a different value from 0.
- **SS.t. = Soft Start Duration Setpoint Value.** This parameter indicates the time to reach set point value when the device is first energised. ⚠ Can be adjustede 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.

A1.o. — If pressed for 2 seconds continuously, Running Mode is entered.

- **A1L = Alarm1 Setpoint Value Lower Limit.** Adjustable between 0 and A1U. parameter value.
- **A1U= Alarm1 Setpoint Value Upper Limit.** Adjustable between A1L. parameter value and upper scale value.
- **A1H= Hysteresis for Alarm1 Output.** Adjustable between 1 and 50 °C.
- **A1t. = Alarm1 Types.** Four kinds of functions can be selected.
  - ind. = Independent alarm
  - dE. = Deviation alarm
  - bAn. = Band alarm (Band)
  - bAi = Band with inhibition alarm
- **A1S. = Alarm1 Output Status.**
  - Hi = If A1output is above the set value (ON).
  - Lo = If A1output is above the set value (OFF).
- **A1E. = Alarm1 Output Status in Case of Sensor Failure.**
  - on = A1 output ON when the sensor in failure.
  - oFF= A1 output OFF when the sensor in failure.

A2.o. — ⚠ This parameter visible only in SSR devices if the o5E parameter is selected as SSr.

- **A2L= Alarm2 Setpoint Value Lower Limit.** Cab be adjusted between 0 and A2U. parameter value.
- **A2U= Alarm2 Setpoint Value Upper Limit.** Can be adjusted between A2L. parameter value and upper scale value.
- **A2H= Output Hysteresis for Alarm2 Output.** Can be adjusted between 1 and 50°C.
- **A2t. = Alarm2 Types.** Four kinds of functions can be selected.
  - ind. = Independent alarm
  - dE. = Deviation alarm
  - bAn. = Band alarm (Band)
  - bAi = Band with inhibition alarm
- **A2S. = Alarm2 Output Status.**
  - Hi = If A2 output is above the set value (ON).
  - Lo = If A2 output is above the set value (OFF).
- **A2E. = Alarm2 Output Status in Case of Sensor Failure.**
  - on = A2 output ON when the sensor in failure.
  - oFF= A2 output OFF when the sensor in failure.

CnF.

- **inP. = Input Type Section**
  - J = J Type,
  - K = K Type,
  - L = L Type,
- **Uni = Temperature unit value.** °C = °C , °F = °F ⚠ Changing this parameter causes some of the parameters to change.
- **Ctr. = Control Type Selection.**
  - HEA= Heating selection (Above the set value; "OFF")
  - Col. = Cooling selection (Above the set value; "ON")
- **FLt. = Digital Filter Coefficients.** Provides to filtering the measured value. Can be adjusted between 1 and 200. If this parameter set to 1, the digital filter runs faster. If the parameter set to 200, the filter runs too slow. This parameter value should be increased in interference environments.
- **o5E. = Control Output Selection.**
  - C.A2= 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.

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

SEC.

- **S.Cd. = Security menu access code 402 must be entered.**

⚠ By pressing once to PRG key S.Cd must be set to 0, then by pressing to PRG key for 4 seconds and dPr message appears and the default settings applied.

- **Co.S. = C.o. menu security, access level parameter.** non. = Menu invisible. PSE. = Modification can be done. Pno = Only visible.
- **A1.S. = A1.o. menu security, access level parameter.** non. = Menu invisible. PSE. = Modification can be done. Pno = Only visible.
- **A2.S. = A2.o. menu security, access level parameter.** non. = Menu invisible. PSE. = Modification can be done. Pno = Only visible.
- **Cn.S. = CnF. menu security, access level parameter.** non. = Menu invisible. PSE. = Modification can be done. Pno = Only visible.

STARTING SELF TUNE

Running Mode

If the Atu. parameter is on and if, SET / AT key is pressed for 4 seconds in Running Mode, self tune started automatically.

if the temperature is not high, Atu. message flashes on display and self tune process starts automatically. If the initial temperature is higher to self tune, tH i message appears and the device waits until the temperature goes down. Then Atu. message appears and automatically self tune procedure is starts. After the self tune procedure, C.Pb, C.t, C.dt and C.Ct. values are recorded in memory, then the device returns to Run Mode. After the successful self tune completion, Atu. parameter menu is automatically oFF . In order

STOPPING SELF TUNE

The self-tune operation can be terminated by pressing to SET / AT or PRG key for 2 seconds and the system return to "Running Mode".

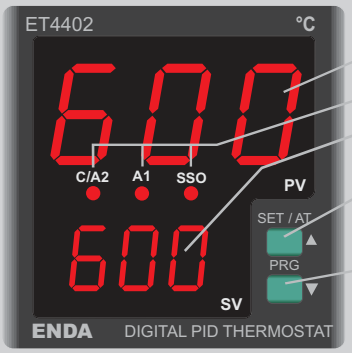
Parameter Setting Diagram

If no key is pressed for 3 seconds, "Running Mode" is entered.

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.

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).

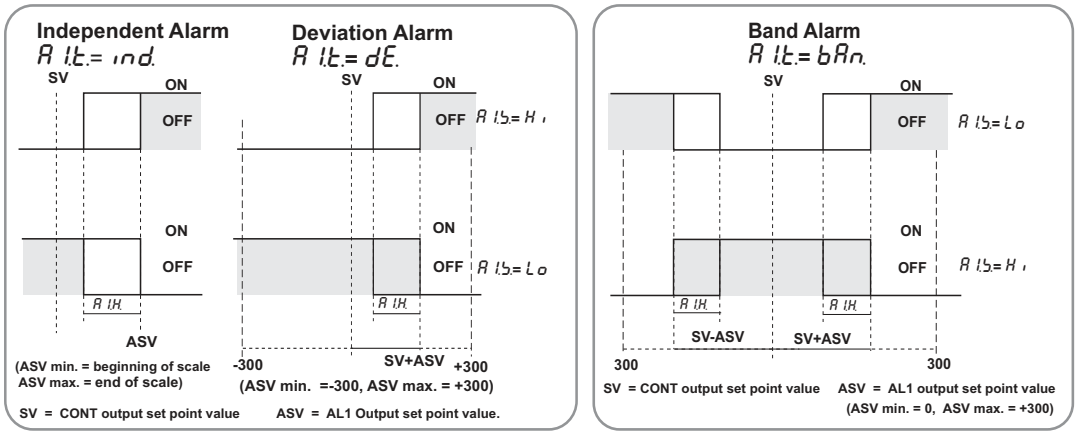
(4) Control setpoint input adjustment and self tune key (Running Mode).
Parameter selection key (Programming Mode).
Value increment key (Running Mode and Programming Mode).

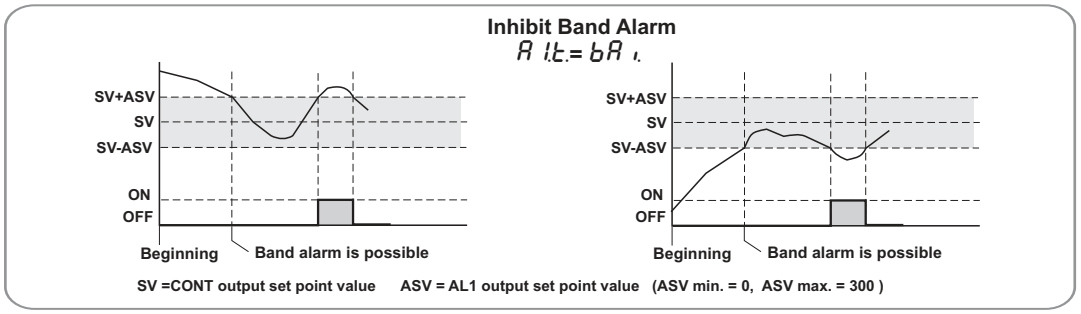
(5) Programming Mode enter key (Running Mode).
Menu selection key (Programming Mode).
Parameter setting transition key (Programming Mode).
Value decrement key (Running Mode and Programming Mode).

(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	3 Red LEDs for Control , Alarm1 and SSR outputs

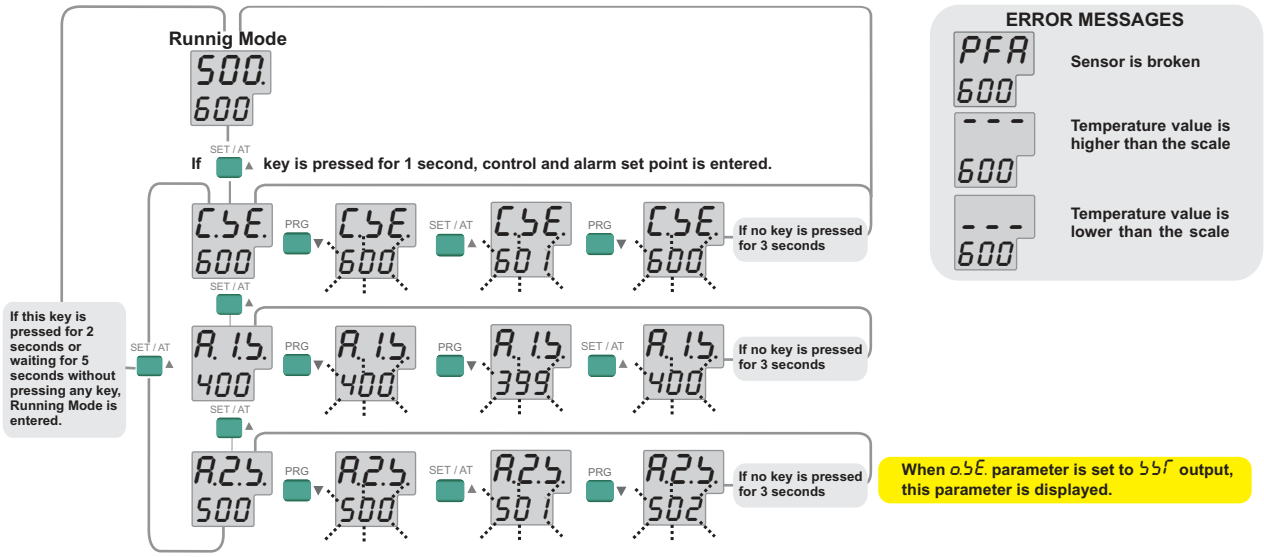
ALARM1 AND ALARM2 OUTPUT TYPES

(Graphics are for alarm 1)





CONTROL AND ALARM SET POINT ADJUSTMENT



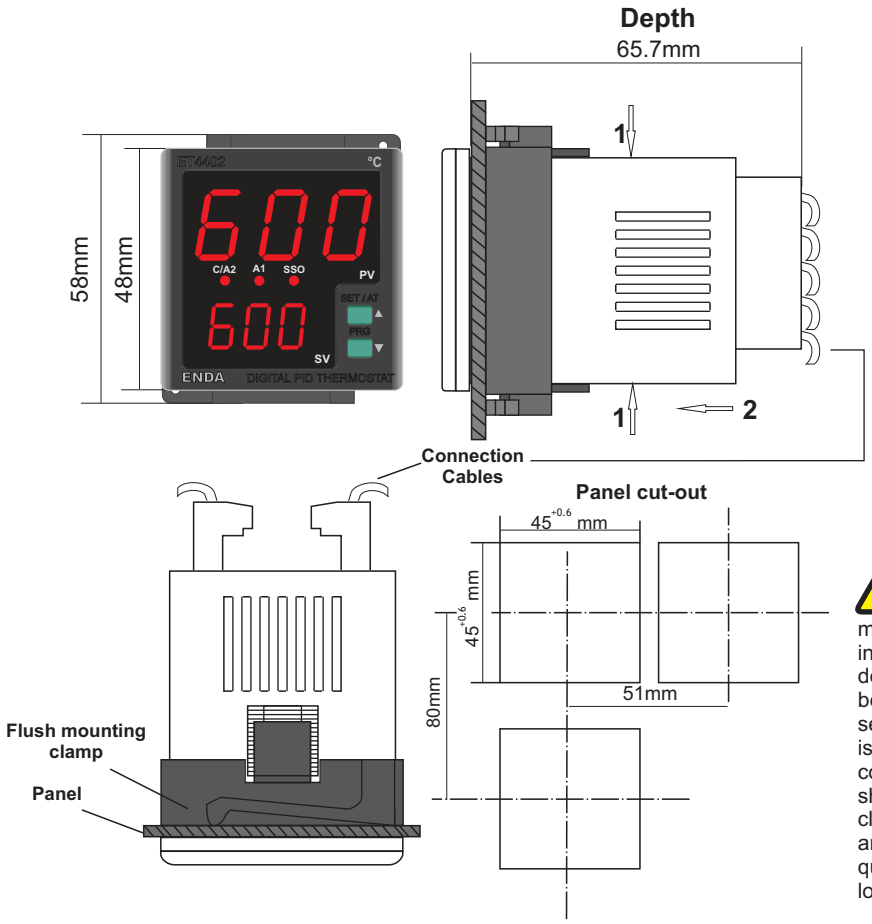
ERROR MESSAGES

Sensor is broken

Temperature value is higher than the scale

Temperature value is lower than the scale

DIMENSIONS



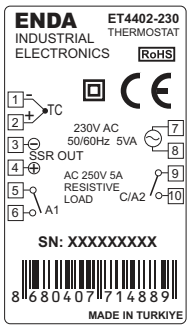
For removing mounting clamps ;
- Push the device in direction **1** as shown in the figure.
- Then pull out the device in direction **2** .

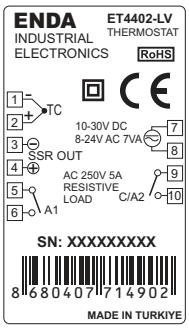
Note : 1) While performing panel mounting, additional space should be allocated for cables.
2) Panel thickness should be maximum 9mm.
3) If there is no 100mm free space at back side of the device, it would be difficult to remove it from the panel.

ENDA ET4402 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.

CONNECTION DIAGRAM





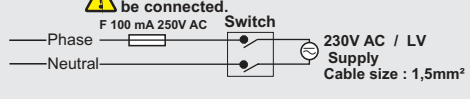
Note : **1)** Mains supply cords shall meet the requirements of **IEC 60227** or **IEC 60245**.
2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

Holding screw 0.4-0.5Nm.

Equipment is protected throughout by DOUBLE INSULATION

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