
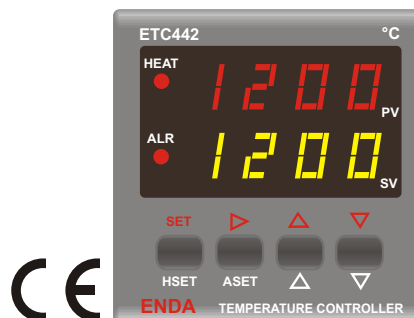
 Read this document carefully before using this device. The guarantee will be expired by damaging of the device if you don't attend to the directions in the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

# ENDA ETC442 PID TEMPERATURE CONTROLLER

Thank you for choosing ENDA ETC442 temperature controller.


- \* 48 x 48mm.
- \* Selectable sensor type.
- \* Input offset feature.
- \* Automatic calculation of PID parameters (SELF TUNE).
-  Enter PID parameters of the system if they are known at the beginning. Otherwise, Self-Tune should be activated.
- \* Configurable Heat/Cool control.
- \* Input offset feature
- \* Adjustable main output during sensor failure.
- \* Parameter access protection on 3 levels.
- \* Change over automatically as actuators between 0-100%
- \* Programming just by using keypad.



## TECHNICAL SPECIFICATIONS

Sensor type		Temperature range		Accuracy
		°C	°F	
J (Fe-CuNi) Thermocouple	EN 60584	0... 600°C	+32... +1112°F	± 0,2% (of full scale) ± 1 digit
K (NiCr-Ni) Thermocouple	EN 60584	0...1200°C	+32... +2192°F	± 0,2% (of full scale) ± 1 digit
T (Cu-CuNi) Thermocouple	EN 60584	0... 400°C	+32... +752°F	± 0,2% (of full scale) ± 1 digit
S (Pt10Rh-Pt) Thermocouple	EN 60584	0...1600°C	+32... +2912°F	± 0,2% (of full scale) ± 1 digit
R (Pt13Rh-Pt) Thermocouple	EN 60584	0...1600°C	+32... +2912°F	± 0,2% (of full scale) ± 1 digit
Pt 100 Resistance Thermometer	EN 60751	-200...600°C	-328... +1112°F	± 0,2% (of full scale) ± 1 digit
Pt 100 Resistance Thermometer	EN 60751	-99.9...300.0°C	-99.9...+543.0°F*	± 0,2% (of full scale) ± 1 digit

\* Display restricted


ENVIRONMENTAL CONDITIONS	
Ambient/storage temperature	0 ... +50°C/-25... +70°C, (without condense)
Max. relative humidity	80% up to 31 °C decreasing linearly 50% at 40 °C
Rated pollution degree	According to EN 60529 Front panel : IP60 Rare panel : IP20
Height	Max. 2000m
 Do not use the device in locations subject to corrosive and flammable gases.	

ELECTRICAL CHARACTERISTICS	
Supply	230V AC +10% -20%, 50/60Hz or 24V AC ±10%, 50/60Hz
Power consumption	Max. 5VA
Wiring	2.5mm² screw-terminal connections
Line resistance	For thermocouple max.100Ω, for 3 wired Pt 100 max. 20Ω
Data retention	EEPROM (> 10 years)
EMC	EN 61326-1: 1997, A1: 1998, A2: 2001 (Performance criterion B for standard EN 61000-4-3)
Safety requirements	EN 61010-1: 2001 (Pollution degree 2, overvoltage category II)

OUTPUTS	
HEAT	Relay : NO+NC, 250V AC, 2A (for resistive load), or 12V DC 20mA logic output
ALARM	Relay : NO, 250V AC, 2A ( for resistive load), can programmed as NC function.
Life expectancy for relay	Mechanical 30.000.000 operation; Electrical 300.000 operation

CONTROL	
Control type	Single set-point and alarm control
Control algorithm	On-Off / P, PI, PD, PID (selectable)
A/D converter	Better than 15 bits
Sampling time	400ms
Proportional band	Adjustable between 0% and 100%. If Pb=0%, ON/OFF control is selected.
Integral time	Adjustable between 0.0 and 100.0 minutes
Derivative time	Adjustable between 0.00 and 25.00 minutes
Control period	Adjustable between 4 and 250 seconds
Hysteresis	Adjustable between 1 and 50°C (122°F)
Actuator function (P.Err.)	Change over automatically as actuators between 0-100% power by sensor defect

HOUSING	
Housing type	Suitable for flush-panel mounting according to DIN 43 700.
Dimensions	W48xH48xD87mm
Weight	Approx. 250g (incl. packaging)
Enclosure material	Self extinguishing plastics.

 While cleaning the device, don't use solvents (thinner, benzine, acid etc.) or corrosive materials

TERMS

(1) Process value during normal operation  
Mnemonic parameter code during programming

(2) Set point during normal operation.  
Data value during programming

(3) Increment key during normal operation and programming  
Parameter selection key during programming

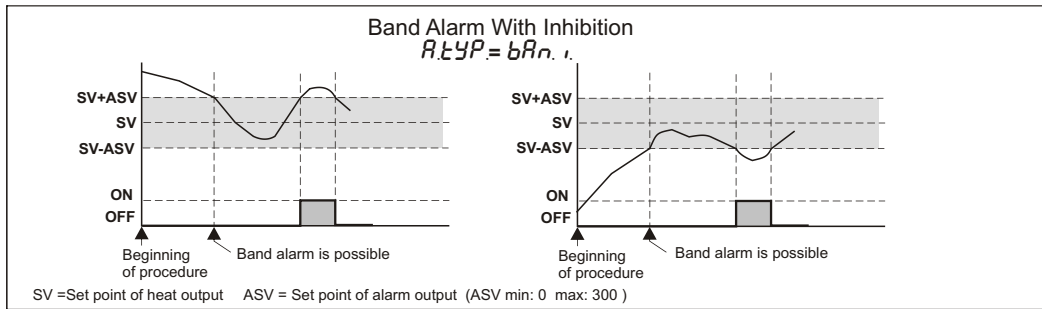
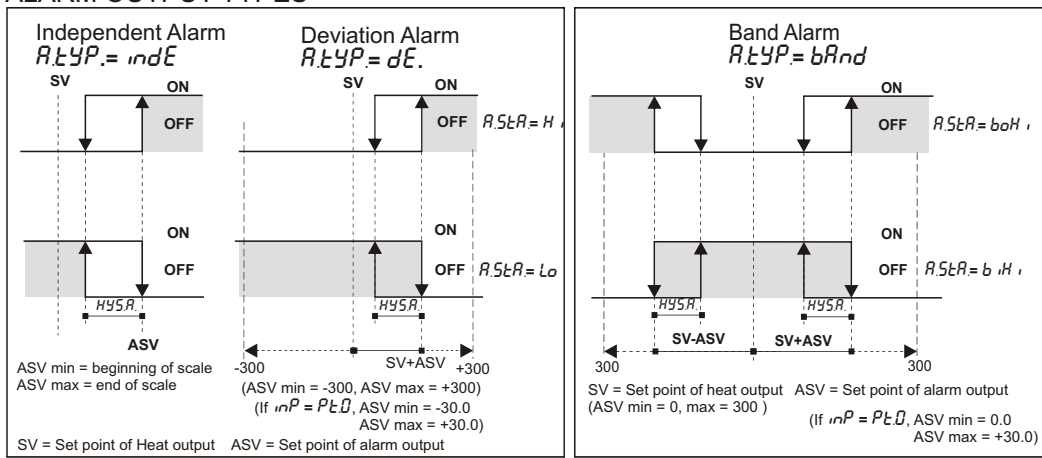
(4) Decrement key during normal operation  
If only this key is pressed in normal operation, software version number is seen.  
Parameter selection during programming

(5) Alarm set key during normal operation  
Menu selection key during programming

(6) Heat (main) set key during normal operation  
Parameter selection key during programming

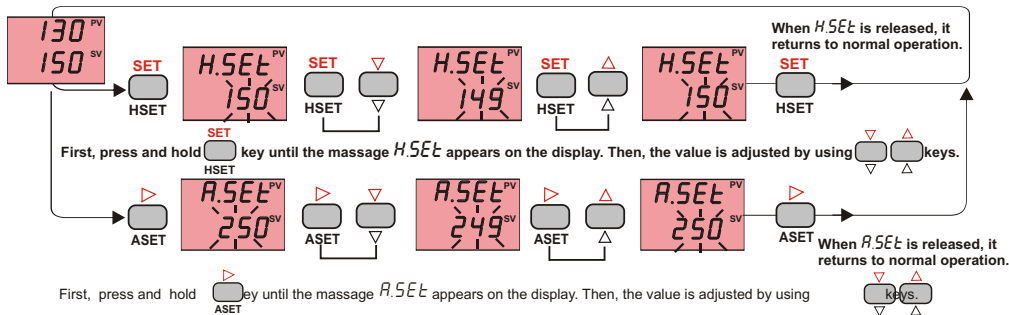
( 1 ) PV display	4 digit seven segment red LED
( 2 ) SV display	4 digit seven segment yellow LED
Character heights	PV display :7mm SV display :7mm
( 3 ),( 4 ),( 5 ),( 6 ) Keypad	Microswitch
( 7 ) State indicator	2 red LEDs for HEAT and ALARM outputs

ALARM OUTPUT TYPES



By the diagrams are shown only switching examples for positive ASV-Parameters !

MODIFICATION OF HEAT AND ALARM SET POINTS



NOTE: The maximum of H.SET is the value of  $wPL$  parameter and the minimum of it is the value of  $LoL$  parameter.  
If independent alarm is selected, A.SET value can be adjusted between the limits of the full scale.  
If deviation alarm is selected, A.SET value can be adjusted between -300 and +300.  
If band alarm is selected, A.SET value can be adjusted between 0 and +300.

**Error Messages**

Temperature value is higher than the end of the scale

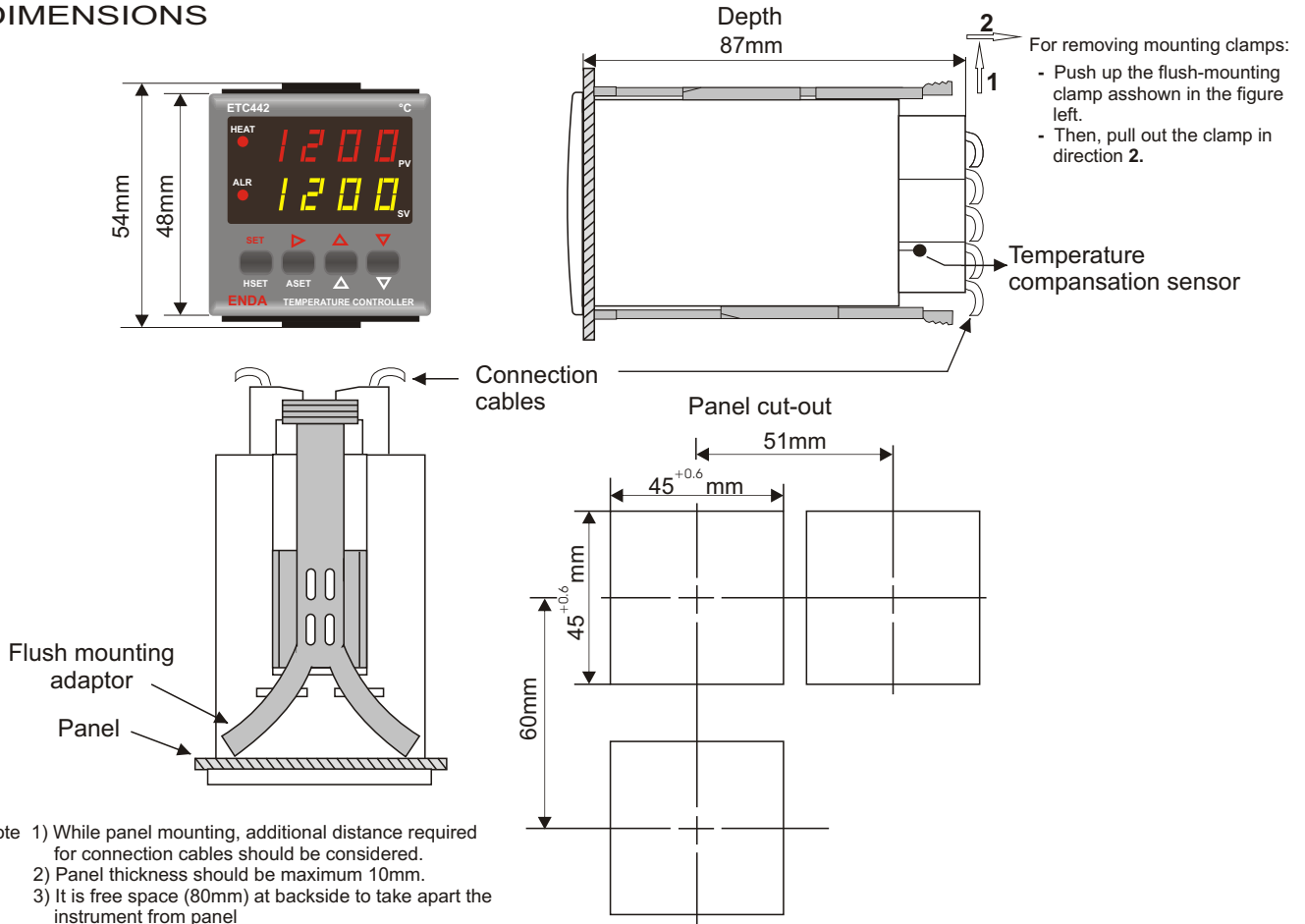
Temperature value is lower than the beginning of the scale

Temperature sensor is broken or over temperature

Pt 100 or a sensor line is short circuited



# DIMENSIONS



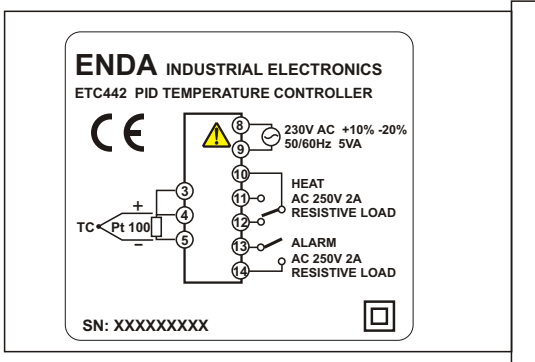
- Note 1) While panel mounting, additional distance required for connection cables should be considered.  
 2) Panel thickness should be maximum 10mm.  
 3) It is free space (80mm) at backside to take apart the instrument from panel



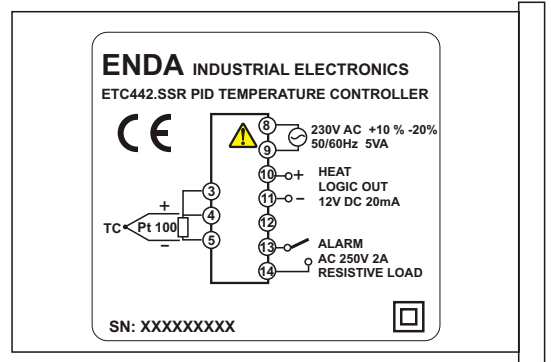
## ATTENTION ! / CONNECTION DIAGRAM

ENDA ETC 442 is intended for installation in control panels. Make sure that the device is used only for intended purpose. During an installation in a panel, all of the cables that are connected to the device must be free of energy. The device must be installed so that is protected against inadmissible humidity, vibrations, severe soiling and 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 shielding must be grounded on the instrument side. The electrical connections must be carried on by a qualified staff and must be according to the relevant locally applicable regulations.

Terminal Connection ETC442



Terminal Connection ETC442-SSR



### NOTE :

#### Supply :

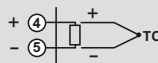
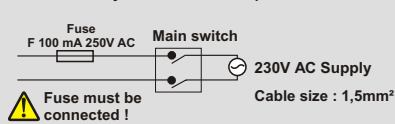
184-253V AC (8) ← L  
 50/60Hz 5VA (9) ← N

#### SENSOR INPUT :

For J-K-T-S-R type thermocouple :  
 Use suitable compensation cables. Don't use jointed cables. Pay attention to the polarities of the thermocouple cables as shown in the figure right

For resistans thermometer :  
 When 2 wired Pt 100 is used, terminals 1 and 2 must be short circuited.

If necessary use for the load separate fuse !



Logic output of the instrument ETC442-SSR is not electrically insulated from the internal circuits. Therefore, when using a grounding thermocouple, do not connect the logic output terminals to the ground.

#### Note :

- 1) Cables for supply must be IEC60799 or IEC60245 conform.
- 2) Main switch should be with in easy reach and should be indicated !

Supply	HEAT Output	Order code
230V AC +10% -20%	Relay	ETC442
	Logic output	ETC442-SSR
24V AC ±10%	Relay	ETC442-24
	Logic output	ETC442-24-SSR