



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 EPA241 PROGRAMMABLE AC/DC AMMETER

Thank you for choosing ENDA EPA241 programmable AC/DC ammeter.

- * 35 x 77mm sized.
- * 4 digits display.
- * Easy to use by front panel keypad.
- * Can be used with current transformer or shunt.
- * Programmable scale between 5A and 9999A.
- * Multifunctional alarm output (NO+NC) for upper and lower limits.
- * CE marked according to European Norms.
- * Measuring type can be selected AC, DC or True RMS



R^{HS}
Compliant



Order Code: EPA241- ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

1 - Input Type

S.....Internal Shunt Resistor
None...External Shunt Resistor

2 - Output

R.....Relay
None...No Relay

3 - Supply Voltage

230VAC...230V AC
24VAC.....24V AC
SM.....9-30V DC / 7-24V AC

4 - ModBus

RS...ModBus (optional)
Ammeter with current transformer used to provide isolation of the ModBus communication.

Technical Specifications

ENVIRONMENTAL CONDITIONS

Ambient/stroge temperature	0 ... +50°C/-25 ... 70°C
Max. Relative humidity	80% up to 31°C decreasing linearly 50% at 40°C.
Rated pollution degree	According to EN 60529 Front panel : IP65 , Rear 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 or optional 9-30V DC / 7-24V AC ±10% SMPS		
Power consumption	Max. 5VA		
Wiring	1.5mm² screw-terminal connections		
Scale	AC and RMS DC	0A...9999A (Specified c.t.r.r parameter. For example:scale is 0A...5A for c.t.r.r=5.00) -999A...9999A (Specified c.t.r.r parameter. For example:scale is -5A...5A for c.t.r.r=5.00)	
Sensitivity	0.002A x c.t.r.r (For example , 0.01A for c.t.r.r=5.00)		
Accuracy	AC DC RMS	± 1% (full scale) (± 2% For square wave form) ± 1% (full scale) ± 1% (full scale) (± 2% For square wave form)	
Input Range	EPA241Sxx EPA241xx	-5A...5A (Device breaks down at more than 10A peak and more current.) -60mV...60mV (Device breaks down at more than 50V peak and more voltage.)	
Input impedance	EPA241Sxx EPA241xx	12mΩ 40kΩ	
Frequency Range	DC , 10Hz - 200Hz (For square wave form 10Hz-70Hz)		
EMC	EN 61326-1: 1997, A1: 1998, A2: 2001 (Performance criterion B for the EMC standard)		
Safety requirements	EN 61010-1: 2001 (Pollution degree 2, overvoltage category II)		

OUTPUTS

Alarm output	Relay: 250V AC, 8A (for resistive load), NO+NC
Life expectancy for relay	Mechanical 30.000.000 ; Electrical 100.000 operation.

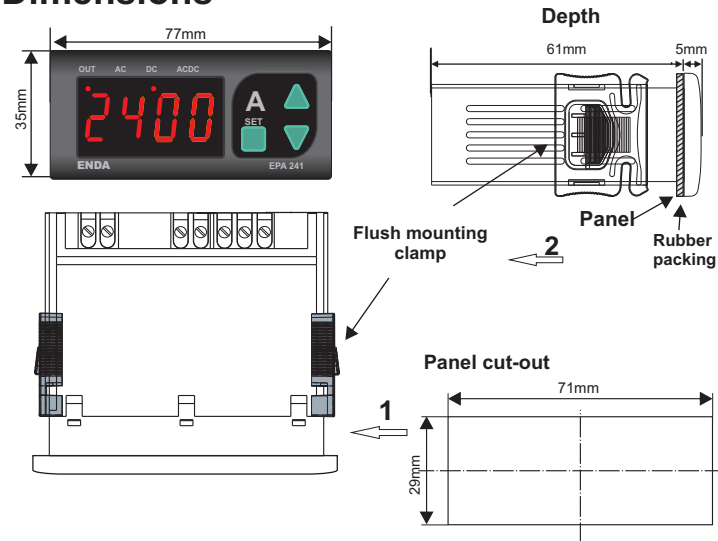
HOUSING

Housing type	Suitable for flush-panel mounting.		
Dimensions	W77xH35xD71mm		
Weight	EPA241	Approx. 250g (after packing)	
	EPA241-24	Approx. 250g (after packing)	
Enclosure material	Self extinguishing plastics.		



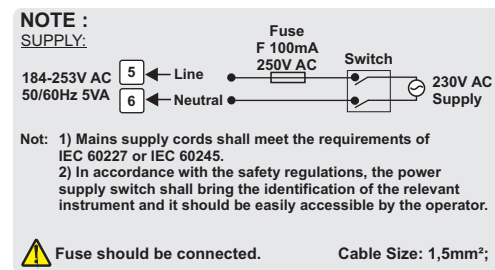
While cleaning the device, solvents (thinner, benzine, acid etc.) or corrosive materials must not be used.

Dimensions

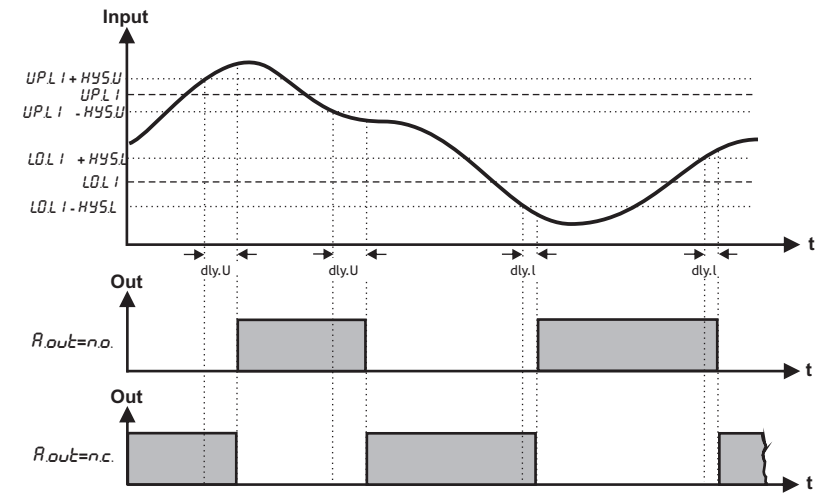


To remove the device from panel:
- While pushing the the flush-mounting clamp in direction 1,pull out it in direction 2.

- 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.



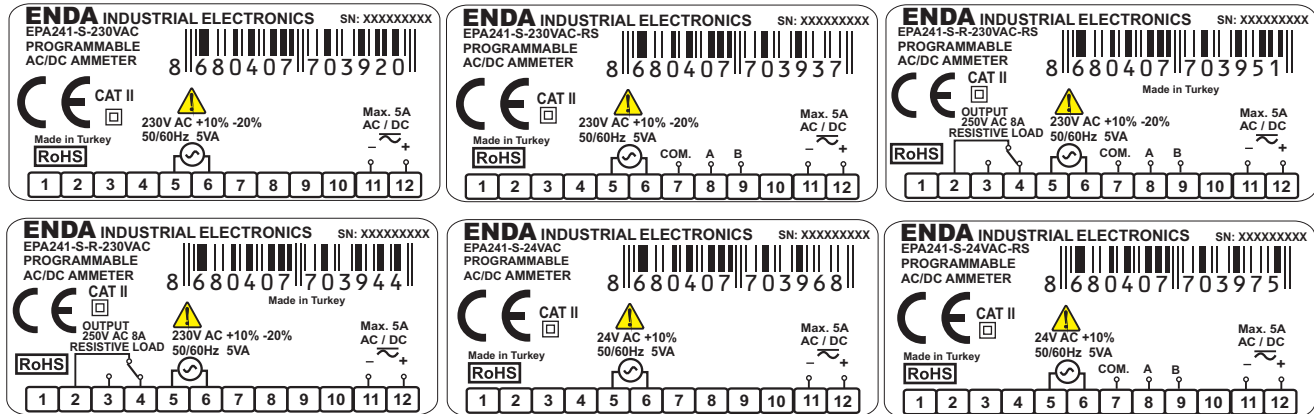
- Equipment is protected throughout by DOUBLE INSULATION
- Holding screw 0.4-0.5Nm.



Connection Diagram



ENDA EPA241 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 staffand 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. Make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.



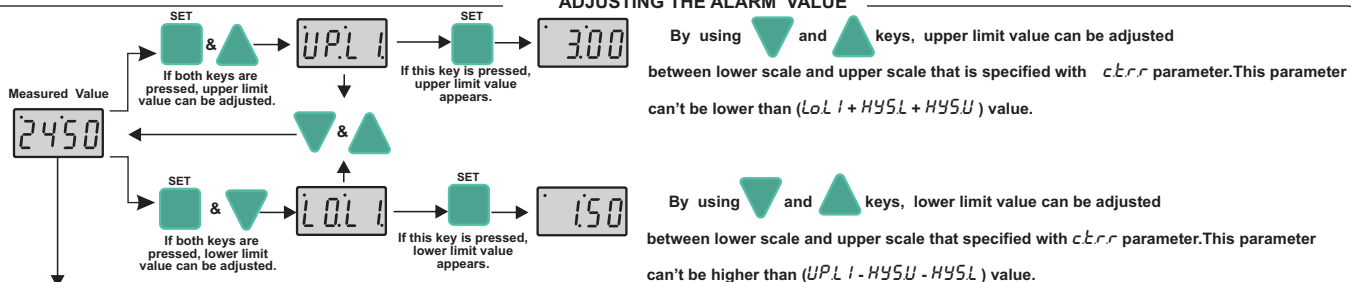
	ac	dc	Ac.dc (rms)
	$A \frac{1}{\sqrt{2}}$	0.000	$A \frac{1}{\sqrt{2}}$
	0.308 A	$A \frac{2}{\pi}$	$A \frac{1}{\sqrt{2}}$
	0.386 A	$A \frac{1}{\pi}$	$A \frac{1}{2}$
	A	0.000	A
	$A \frac{1}{2}$	$A \frac{1}{2}$	$A \frac{1}{\sqrt{2}}$
	$A \sqrt{\frac{d}{T} - \frac{d^2}{T^2}}$	$A \frac{d}{T}$	$A \sqrt{\frac{d}{T}}$
	$A \frac{1}{\sqrt{3}}$	0.000	$A \frac{1}{\sqrt{3}}$

EPA241 PROGRAMMING DIAGRAM



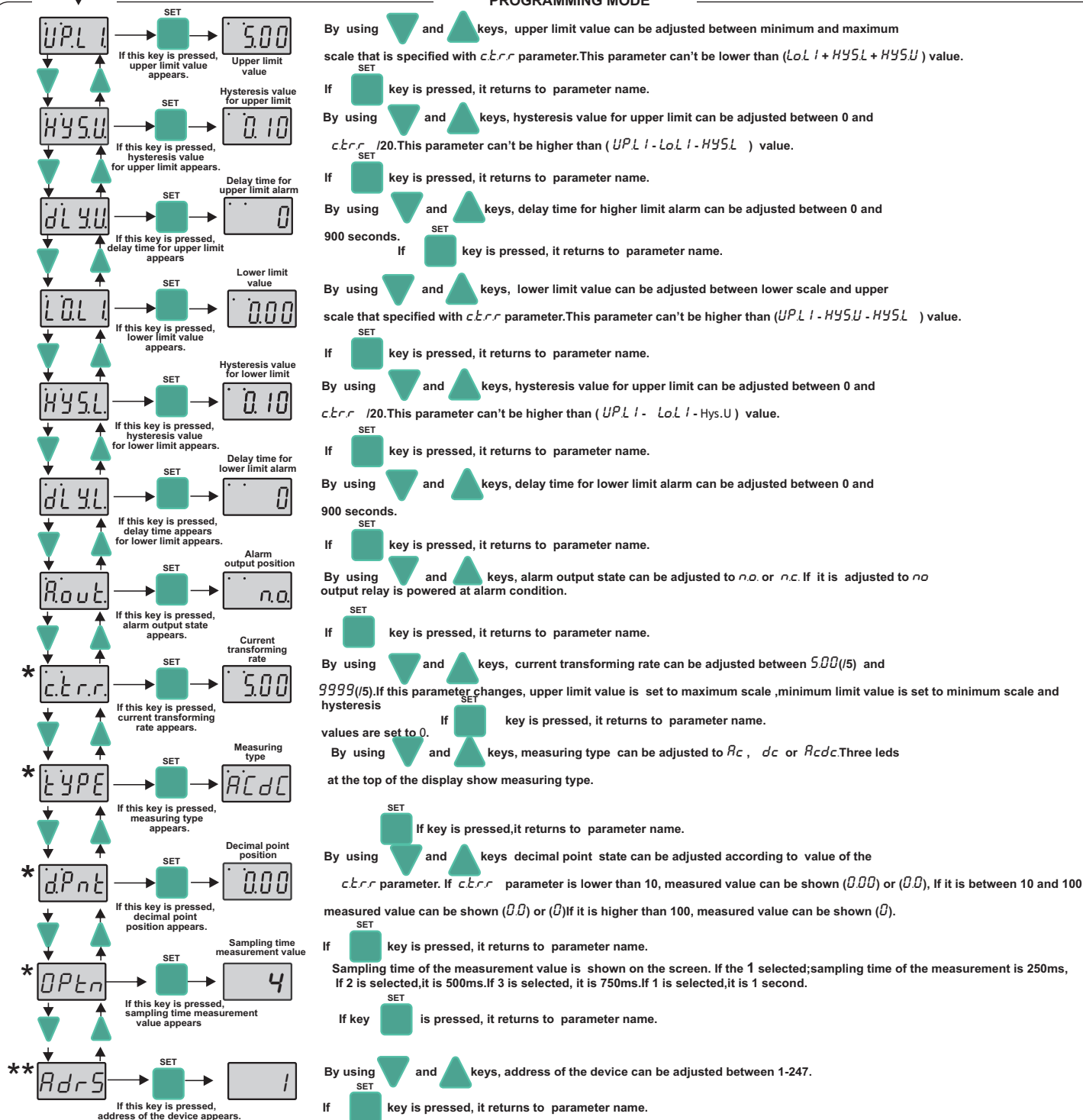
- Increment key** Used for increasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value increases faster.
- Decrement key** Used for decreasing the setpoint value and changing parameter. When held down for a few seconds, configured numeric value decreases faster.
- Programming key** Used for displaying and configuring the selected parameter value.

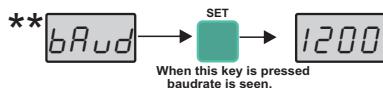
ADJUSTING THE ALARM VALUE



If both & keys are pressed and held for 3 seconds, programming mode is entered. If & keys are pressed while parameter names are displayed, then it returns to measured value mode.

PROGRAMMING MODE





By using and keys, baudrate value of the device can be adjusted to OFF,1200,2400,4800,9600,19200.

If key is pressed, it returns to parameter name.

(*) There are only *ctrr*, *type*, *dPnt* and *oPtn* parameters in the devices those have no relay.

(**) The *Addr5* and *bAud* parameters are only in the devices those have modbus.

If any key is pressed in 25 seconds or the device is powered down and powered up, then it returns to operation mode.

NOTE: If key is held down while the device is powered up, the *dPrr* message will appear and the factory settings will be restored.

ERROR MESSAGES



Means, measured current value is higher than maximum scale.



Means, measured current value is lower than minimum scale.

ENDA EPA241 DIGITAL AMPERMETER MODBUS PROTOCOL ADDRESS MAP

1.1 HOLDING REGISTERS

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
0000d	0x0000	word	The upper limit of the setpoint	<i>uPLI</i>	Readable/Writable	5.0
0001d	0x0001	word	The upper limit of the hysteresis value	<i>HY5U</i>	Readable/Writable	0.10
0002d	0x0002	word	Delay time for the upper limit alarm	<i>dLYU</i>	Readable/Writable	0
0003d	0x0003	word	The lower limit of the setpoint	<i>LoLI</i>	Readable/Writable	0
0004d	0x0004	word	The lower limit of the hysteresis value	<i>HY5L</i>	Readable/Writable	0.10
0005d	0x0005	word	Delay time for the lower limit alarm	<i>dLYL</i>	Readable/Writable	0
0006d	0x0006	word	Current replacement rate	<i>ctrr</i>	Readable/Writable	5
0007d	0x0007	word	Measurement method (0=AC, 1=DC, 2=ACDC)	<i>type</i>	Readable/Writable	ACDC
0008d	0x0008	word	Decimal point. (0=X.XX, 1=X.X, 2=X)	<i>dPnt</i>	Readable/Writable	X.XX
0009d	0x0009	word	Sampling time of the measurement value. If 1 is selected, it is 250ms. If 2 is selected, it is 500ms. If 3 is selected, it is 750ms. If 4 is selected, it is 1 second.	<i>oPtn</i>	Readable/Writable	4
0010d	0x000A	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>Addr5</i>	Readable/Writable	1
0011d	0x000B	word	Baudrate (0=Off; 1=1200; 2=2400; 3=4800; 4=9600; 5=19200)	<i>bAud</i>	Readable/Writable	OFF

*Holding Register Parameter Table (No Relay Models)

0000d	0x0000	word	Current replacement rate	<i>ctrr</i>	Readable/Writable	5
0001d	0x0001	word	Measurement method (0=AC, 1=DC, 2=ACDC)	<i>type</i>	Readable/Writable	ACDC
0002d	0x0002	word	Decimal point. (0=X.XX, 1=X.X, 2=X)	<i>dPnt</i>	Readable/Writable	X.XX
0003d	0x0003	word	Sampling time of the measurement value	<i>oPtn</i>	Readable/Writable	4
0004d	0x0004	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>Addr5</i>	Readable/Writable	1
0005d	0x0005	word	Baudrate (0=Off; 1=1200; 2=2400; 3=4800; 4=9600; 5=19200)	<i>bAud</i>	Readable/Writable	9600

1.2 INPUT REGISTERS

Input Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured current value	--	Only Readable

1.3 DISCRETE INPUTS

Discrete Input Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
00d	0x00	Bit	Relay output state (0=OFF; 1=ON)	--	Only Readable

1.4 COILS

Coil Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
00d	0x00	Bit	Alarm output state (0=NO; 1=NC)	<i>Alout</i>	Readable/Writable	

*Coil and Discrete input parameters are not available in the devices those have no relay