



Read this document carefully before using this device. The guarantee will be expired by device damages 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 EPV741A AC/DC VOLTMETER

Thank you for choosing **ENDA EPV741A** AC/DC voltmeter.

- \* 72 x 72mm sized.
- \* 3 digits display.
- \* Values between -100V and 100 V can be indicated with one decimal point.
- \* For maximum 50V AC/DC measurements, measurements between -50V and +50V can be shown with two decimal digits by having 10 times more accurate measurement input.
- \* Easy to configure with front panel keypad.
- \* Multifunctional alarm output (N.O.) for upper and lower limits.
- \* Communication feature over isolated RS485, using ModBus RTU protocol (Functional).
- \* Measuring type can be selected as AC, DC or true RMS.
- \* CE marked according to European Norms.

Order Code : EPV741A-  -  -   
1 2 3

<b>1-Output</b>	<b>2-Supply Voltage</b>	<b>3-ModBus</b>
R.....Relay	230VAC...230V AC	RSI..... Insulated ModBus (optional)
None...No relay	110VAC...110V AC	
	24VAC.....24V AC	
	SM.....9-30V DC / 7-24V AC	



**R<sup>HS</sup>**  
**Compliant**

## Technical Specifications

ENVIRONMENTAL CONDITIONS	
Ambient/stroge temperature	0 ... +50°C/-25 ... 70°C
Max. Relative humidity	Max. 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

**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	2.5mm <sup>2</sup> screw-terminal connections
Scale	AC and RMS : If $\overline{INP};500$ is selected, it is 0V...500V or If $\overline{INP};50$ is selected, it is 0...50V DC : If $\overline{INP};500$ is selected, it is -500V DC....500V DC or If $\overline{INP};50$ is selected, it is -50V DC....50V DC
Sensitivity	0,01V (If $\overline{INP};50$ is selected ) 0,1V (If $\overline{INP};500$ is selected and higher than -100V or lower than 100V for input values) 1V (If $\overline{INP};500$ is selected and lower than -100V or higher than 100V for input values)
Accuracy	AC ± 1% (Full scale) (For square wave form ± 2%) DC ± 1% (Full scale) RMS ± 1% (Full scale) (For square wave form ± 2%)
Input Range	-500V...500V (If $\overline{INP};500$ is selected, device breaks down at more than ±1250 DC voltages.) -50V....50V (If $\overline{INP};50$ is selected, device breaks down at more than ±125 DC voltages.)
Input Impedance	870kΩ
Frequency Range	DC , 10Hz - 200Hz (For square wave form 10Hz-70Hz)
EMC	EN 61326-1: 2013
Safety requirements	EN 61010-1: 2012 (Pollution degree 2, overvoltage category II)

OUTPUTS	
Alarm output	Relay: 250V AC, 8A (for resistive load), N.O.
Life expectancy for relay	Mechanical 30.000.000 ; Electrical 100.000 operation.

HOUSING	
Housing type	Suitable for flush-panel mounting. (According to DIN 43 700)
Dimensions	W72xH72xD97mm
Weight	Approx. 250g (after packing)
Enclosure material	Self extinguishing plastics.

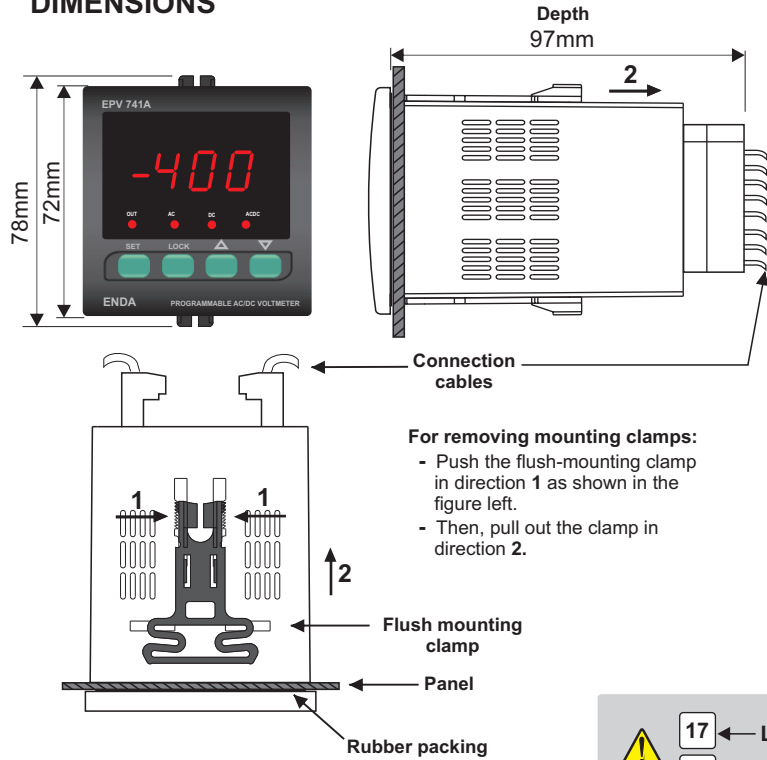
**While cleaning the device, solvents (thinner, benzine, acid etc.) or corrosive materials must not be used.**



**SİSEL MÜHENDİSLİK ELEKTRONİK SAN. VE TİC. A.Ş.**  
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# DIMENSIONS



**For removing mounting clamps:**

- Push the flush-mounting clamp in direction 1 as shown in the figure left.
- Then, pull out the clamp in direction 2.

**Note**

- 1) During panel mounting, additional distance is required for connection cables.
- 2) Panel thickness should be maximum 10mm.
- 3) There must be at least 90mm free space behind the device, otherwise it would be difficult to remove it from the panel.

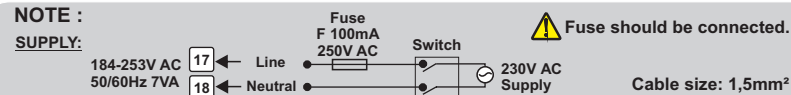
## CONNECTION DIAGRAM



ENDA EPV741A is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must be carried on 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. The device must be protected against inadmissible humidity, vibrations and severe soiling. Make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.



If  $L_{inP}$  input type "500" is selected, the measurement terminals 13 and 16 of the terminals must be connected. Otherwise the measurement will be incorrect.  
If  $L_{inP}$  input type "50" is selected, the measurement terminals 14 and 15 of the terminals must be connected. Otherwise the measurement will be incorrect.



- 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

**RoHS Compliant**

**ENDA INDUSTRIAL ELECTRONICS**  
EPV741A-230VAC-RSI  
PROGRAMMABLE AC/DC VOLTMETER

Max. 500V AC/DC

Max. 50V AC/DC

230V AC +10% -20% 50/60Hz 7VA

OUTPUT 230V AC 8A RESISTIVE LOAD

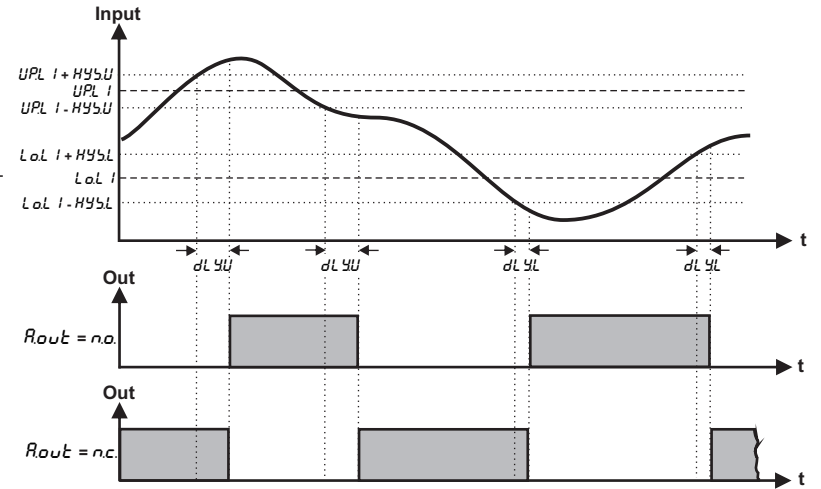
**ENDA INDUSTRIAL ELECTRONICS**  
EPV741A-R-230VAC-RSI  
PROGRAMMABLE AC/DC VOLTMETER

Max. 500V AC/DC

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230V AC +10% -20% 50/60Hz 7VA

OUTPUT 230V AC 8A RESISTIVE LOAD



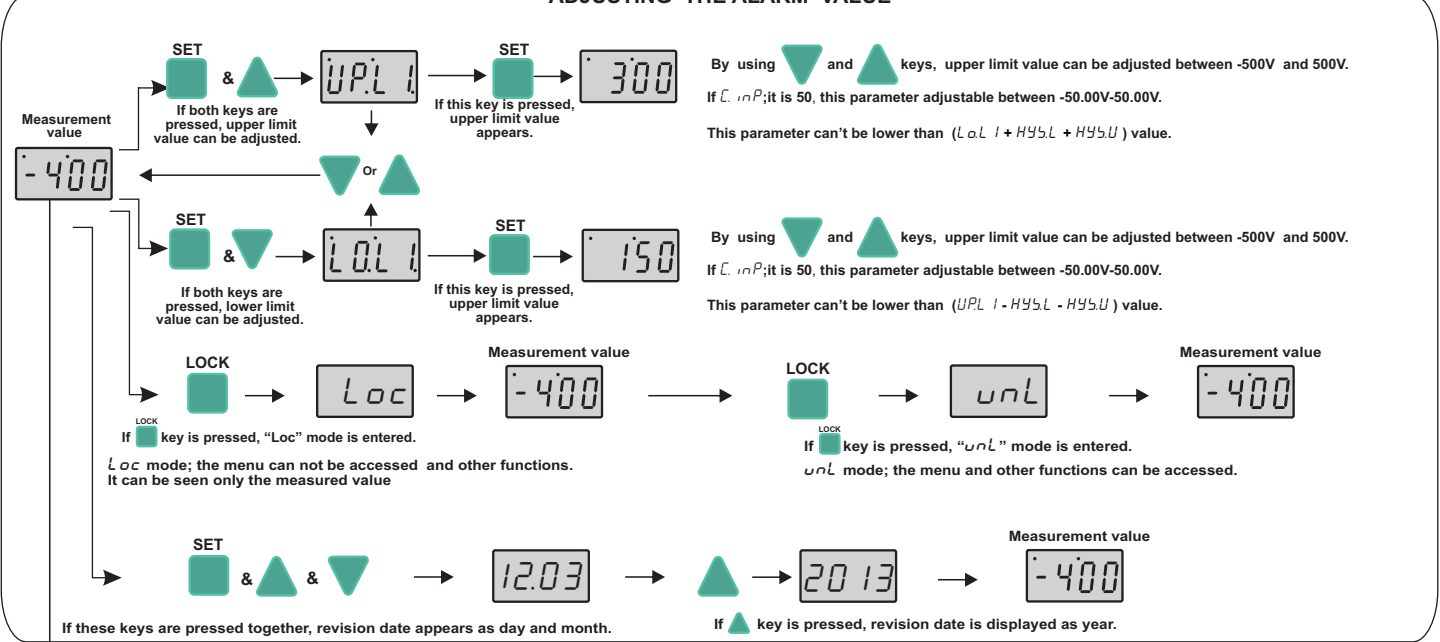
	$R_c$	$d_c$	$R_c.d_c$ (rms)
	$V \frac{1}{\sqrt{2}}$	0.000	$V \frac{1}{\sqrt{2}}$
	0.308 V	$V \frac{2}{\pi}$	$V \frac{1}{\sqrt{2}}$
	0.386 V	$V \frac{1}{\pi}$	$V \frac{1}{2}$
	V	0.000	V
	$V \frac{1}{2}$	$V \frac{1}{2}$	$V \frac{1}{\sqrt{2}}$
	$V \sqrt{\frac{d}{T} - \frac{d^2}{T^2}}$	$V \frac{d}{T}$	$V \sqrt{\frac{d}{T}}$
	$V \frac{1}{\sqrt{3}}$	0.000	$V \frac{1}{\sqrt{3}}$

# EPV741A PROGRAMMING DIAGRAM



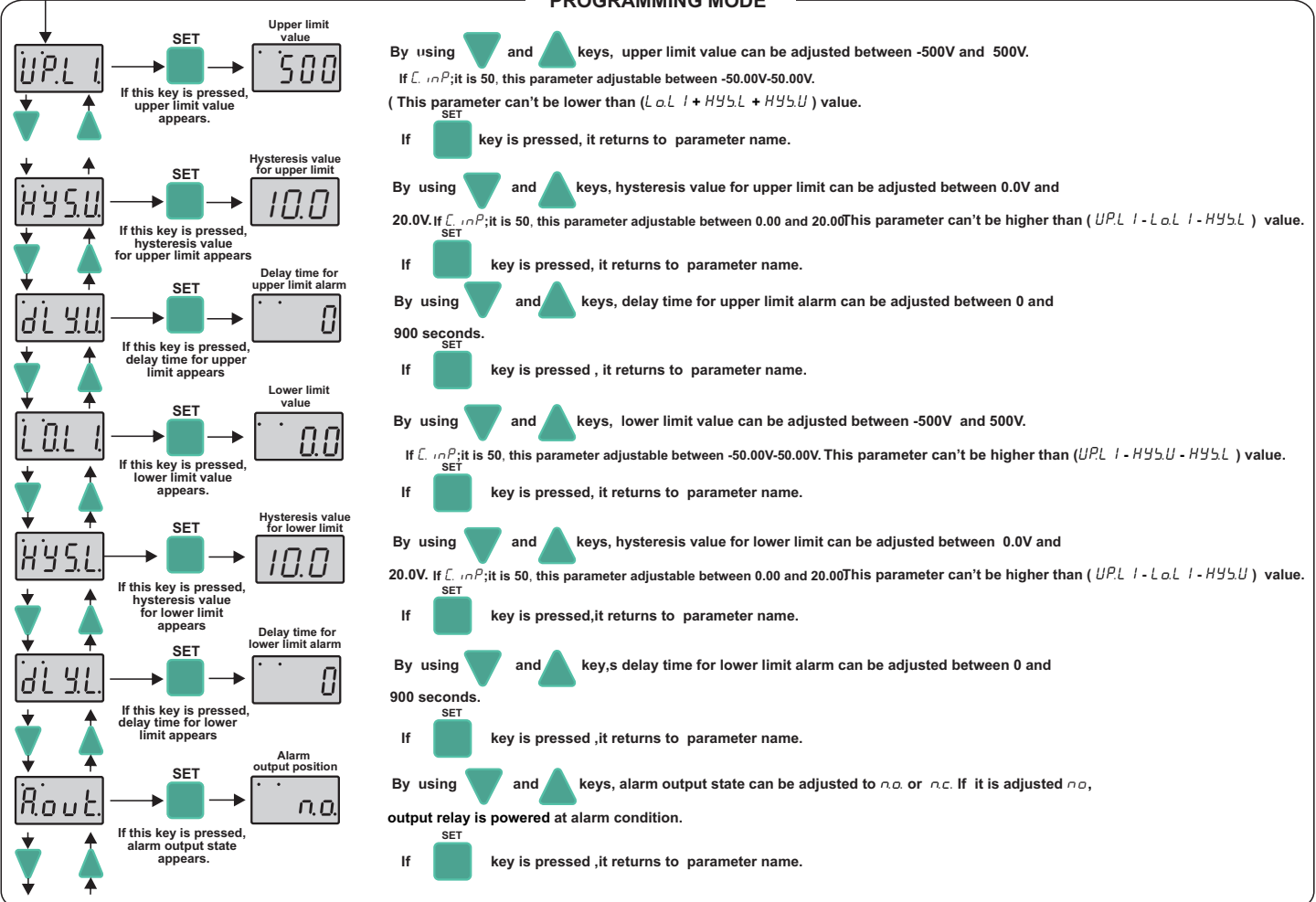
- Increment key** Used for increasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value increases faster.
- Decrement key** Used for decreasing the setpoint value and changing parameter. When held down for a few seconds, configured numeric value decreases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

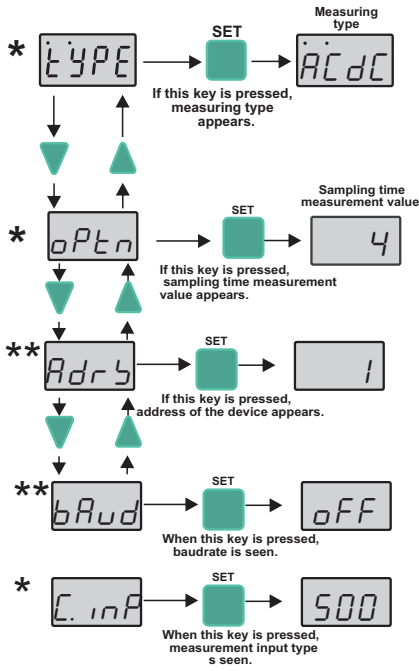
## ADJUSTING THE ALARM VALUE



If these 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, measuring type can be adjusted to  $R_c$ ,  $dc$  or  $Rcdc$ . Three leds at the top of the display show measuring type.

If key is pressed, it returns to parameter name.

Sampling time of the measurement value is shown on the screen. If the 1 selected; sampling time of the measurement is 250ms. If 2 is selected, it is 500ms. If 3 is selected, it is 750ms. If 4 is selected, it is 1 second.

If key is pressed, it returns to parameter name.

By using and keys address of the device can be adjusted between 1-247.

If key is pressed, it returns to parameter name.

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*, *oPtn* parameters in the devices those have no relay.

(\*\*) The *Adr5* and *bAud* parameters are only in the devices those have modbus.



If *C.inP* input type "500" is selected, the measurement terminals 13 and 16 of the terminals must be connected. Otherwise the measurement will be incorrect.  
If *C.inP* input type "50" is selected, the measurement terminals 14 and 15 of the terminals must be connected. Otherwise the measurement will be incorrect.



For returning to measured value and saving to new settings, one of the following options can be applied ;

- Wait for 25 seconds without pressing any key after the programming.
- Press and keys together after the programming.
- Power down and power up the device after the programming.



NOTE : If key is held down while the device is powered up, *dPAr* message will appear and 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 EPV741A DIGITAL VOLTMETER MODBUS PROTOCOL ADDRESS MAP

### 1.1 HOLDING REGISTERS

Holding Register Addresses		Data	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex	Type				
0000d	0x0000	word	The upper limit of the setpoint	<i>uPLI</i>	Readable/Writable	<i>500</i>
0001d	0x0001	word	The upper limit of the hysteresis value	<i>HY5U</i>	Readable/Writable	<i>100</i>
0002d	0x0002	word	Delay time for the upper limit alarm	<i>dLYU</i>	Readable/Writable	<i>0</i>
0003d	0x0003	word	The lower limit of the setpoint	<i>LoLI</i>	Readable/Writable	<i>0</i>
0004d	0x0004	word	The lower limit of the hysteresis value	<i>HY5L</i>	Readable/Writable	<i>100</i>
0005d	0x0005	word	Delay time for the lower limit alarm	<i>dLYL</i>	Readable/Writable	<i>0</i>
0006d	0x0006	word	Measurement method ( <i>0=AC, 1=dC, 2=ACdC</i> )	<i>TYPE</i>	Readable/Writable	<i>ACdC</i>
0007d	0x0007	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	<i>4</i>
0008d	0x0008	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>Adf5</i>	Readable/Writable	<i>1</i>
0009d	0x0009	word	Baudrate (0=Off; 1=1200; 2=2400; 3=4800; 4=9600; 5=19200)	<i>baud</i>	Readable/Writable	<i>off</i>

#### \*Holding Register Parameter Table (No Relay Models)

0000d	0x0000	word	Measurement method ( <i>0=AC, 1=dC, 2=ACdC</i> )	<i>TYPE</i>	Readable/Writable	<i>ACdC</i>
0001d	0x0001	word	Sampling time of the measurement value	<i>oPtn</i>	Readable/Writable	<i>4</i>
0002d	0x0002	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>Adf5</i>	Readable/Writable	<i>1</i>
0003d	0x0003	word	Baudrate (0=Off; 1=1200; 2=2400; 3=4800; 4=9600; 5=19200)	<i>baud</i>	Readable/Writable	<i>off</i>

### 1.2 INPUT REGISTERS

Input Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured voltage value	--	Only Readable
00001	0x0001	word	Measured voltage value. (While the measured value of 3-digit decimal point is read as. This value is "0" in other cases.)	--	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>RoUt</i>	Readable/Writable	<i>no</i>

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