



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 EPA242 PROGRAMMABLE AC/DC AMMETER

Thank you for choosing ENDA EPA242 programmable AC/DC ammeter.

- * 77 x 35mm sized.
- * 4 digits display.
- * Easy to use with front panel keypad.
- * 5A or 60 mV , CT20/30 current transformer or 60 mV input feature (Please Specify at Order).
- * Programmable scale range between 5A and 9999A.
- * Multifunctional alarm output (NO+NC) for upper and lower limits (Optional).
- * Measuring type can be selected as AC, DC or true RMS.
- * Keylock feature.
- * 0-20mA, 4-20mA, 0-10V or 1-5V analog output selection (Please Specify at Order).
- * Communication feature over isolated RS485, using ModBus RTU protocol (Optional).
- * CE marked according to European Norms.



ORDER CODE

EPA242 - CT - R - UV - RSI

Product Base Code	
Programmable ammeter.	EPA242
Input Type	
5A or 60mV (Blank)	—
CT20/30 or 60mV	CT
1A	X1
Output Type (Optional)	
Blank	—
Relay	R
Analog	A

Isolated Modbus (Optional)	
—	Blank
RSI	RS485 Modbus Available
Supply Voltage	
UV	90-250V AC
LV	10-30V DC/8-24V AC

CT20/30 should be ordered separately if required.



INPUTS

Input Type	for EPA242-UV : 5A or 60mV for EPA242-CT-UV : CT20/30 current transformer or 60mV for EPA242-X1-UV : 1A	
Scale	AC and RMS	If input type is 5A / 60mV, scale 0A...9999A : (Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...5A for <i>c.t.r.r</i> = 5)
		If input type is 1A, scale 0A...9999A : (Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...1A for <i>c.t.r.r</i> = 1)
	DC	If input type is CT20/30 / 60mV : If <i>i.t.y.p</i> = <i>CT20</i> , 0A...300A or <i>CT30</i> , 0A...120A (Specified by <i>t.u.r.n</i> parameter. i.e : scale is 0A...300A / 0A...120A for <i>t.u.r.n</i> = 1) If <i>i.t.y.p</i> = <i>5Hnt</i> , 0A...9999A (Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...5A for <i>c.t.r.r</i> = 5)
		If input type is 5A / 60mV, scale : -999A...9999A (Specified by <i>c.t.r.r</i> parameter. i.e : scale is -5A...5A for <i>c.t.r.r</i> = 5) If input type is 1A, scale : -999A...9999A (Specified by <i>c.t.r.r</i> parameter. i.e : scale is -1A...1A for <i>c.t.r.r</i> = 1) If input type is CT20/30 / 60mV : DC measurement can not be performed by using CT. If <i>i.t.y.p</i> = <i>5Hnt</i> , scale : 0A...9999A (Specified by <i>c.t.r.r</i> parameter. i.e : scale is -5A...5A for <i>c.t.r.r</i> = 5)
Sensitivity	0.002A x <i>c.t.r.r</i> (i.e. : 0.01A for <i>c.t.r.r</i> = 5)	
Accuracy	AC/RMS DC	±%1 (full scalen) (±2% For square wave form) ±%1 (full scale)
Input Range	if input type is 60mV : -60mV...60mV (Device may be damaged at 50V and above voltages) if input type is 1A : -1A...1A (Device may be damaged at 2A and above currents) if input type is 5A : -5A...5A (Device may be damaged at 10A and above currents) if input type is CT20/30 : 0...150mA	
Input Impedance	if input type is 60mV : 20kΩ , if input type is 1A : 90mΩ , if input type is 5A : 12mΩ , if input type is CT20/30 : 600mΩ	
Frequency Range	DC, 20Hz-70Hz	

ELECTRICAL SPECIFICATIONS

Supply	90-250V AC , +10% , -20% , 50/60Hz or 10-30V DC / 8-24V AC , 50/60Hz
Power Consumption	Max 7VA
Wiring	2.5mm ² screw-terminal connections
EMC	EN 61326-1: 2013
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

OUTPUTS

Alarm Output (Relay)	250V AC, 8A (for resistive load), NO+NC (Life Expectancy : Mechanical 30.000.000; Electrical 100.000 operation. 250V AC, 8A (resistive load))
Analog output	0-20mA DC or 4-20mA DC, ±0,5% (Load resistance 500Ω max.) 0-10V DC or 1-5V DC, 10mA max., ±0,5% (Short circuit protected)

ENVIRONMENTAL CONDITIONS

Ambient/Storage Temperature	0 ... +50°C/-25 ... 70°C
Max. Relative Humidity	80% Relative humidity for temperatures up to 31°C, decreasing linearly to 50% 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.

HOUSING

Housing Type	Suitable for flush-panel mounting according
Dimensions	G77xY35xD61mm
Weight	Approx. 250g (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**



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- 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 parameters. When held down for a few seconds, configured numeric value decreases faster.
- Programming key** Used for displaying and configuring the selected parameter value.

PROGRAMMING MODE

During "Running Mode", by pressing to and keys together for 3 seconds, the *Conf* message appears and the "Programming Mode" is entered. If no operation is performed during "Programming Mode" for 3 seconds or and keys are pressed once together, returned to the "Running Mode".

Conf → **SET** → **Out 1**

The SET button is used for making a selection between *Conf* or *Out 1* menus. When only key is used, it provides access to the next parameter. If and keys are pressed once together, returned to the *Conf* menu.

ctrr **Current Conversion Ratio**
It can be adjusted between 5(5) and 9999(5). If this parameter changes, upper limit value is set to maximum scale, minimum limit value is set to minimum scale and hysteresis values are set to 0.1
ctrr current conversion rate parameter will not be displayed if *ct20* or *ct30* current transformer is selected in CT input devices.

TYPE **Measuring Method**
It can be adjusted to *Ac*, *dc* or *AcDc*. LEDs on the top of the display indicates the adjusted measurement method.

dPnt **Decimal Indicator**
If measured value is lower than 10, it will be displayed as (0.000), (0.00), (0.0) or (0) or (0).
If measured value between 10 and 100, it will be displayed as (0.00), (0.0) or (0).
If measured value between 100 and 1000, it will be displayed as (0.0) or (0).
The decimal place may change according to the measured value.

OPtN **Sampling Time**
If 1 (1) is selected; sampling time of the measurement is 250ms.
If 2 (2) is selected, it is 500ms.
If 3 (3) is selected, it is 750ms.
If 4 (4) is selected, it is 1 second.

AdrS **Device Address (for Modbus devices only)**
It can be adjusted between 1-247.

bAud **Baud Rate (for "Modbus" devices only)**
It can be adjusted as *OFF*, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

ITYP **Input Type ("CT" input type devices only)**
Can be adjusted to *ct20*, *ct30*, *SHnt* values.
If *SHnt* is selected, 60mV input terminals must be used.
Terminal inputs : (9) and (12)
tUrn (windings) will not be displayed if the input type is set to *SHnt*.

tUrn **Number of Windings (In devices with input type "CT")**
Number of windings of the current cable getting through the CT20/30 current transformer.

	tUrn	1	2	3	4	5	6	7	8	9	10
CT20	lin max(A)	300	150	100	75	60	50	42.8	37.5	33.3	30
CT30	lin max(A)	120	60	40	30	24	20	17.1	15	13.3	12

AtYP **Analog Output Status ("Analog" output type devices only).**
Can be adjusted to 0-20, 4-20, 0-10, 1-5 values.

Out 1 **Out1 Output**
Can be adjusted as *n.o.* or *n.c.* If this parameter set to *n.o.*, out relay will be energized when an alarm condition occurs.

UPLL **Upper Limit Value**
Can be adjusted between minimum and maximum scale that is specified with *ctrr* parameter.
This parameter can't be lower than (*LOLL* - *HYSL* - *HYSU*).

HYSU **Hysteresis Value for Upper Limit**
Can be adjusted between 0 and *ctrr 15* parameter. This parameter can't be higher than (*UPLL* - *LOLL* - *HYSL*).
When *ctrr* changed, *HYSU* gets the value of 0.1.

dLYU **Delay Time for Upper Limit Alarm**
Can be adjusted between 0 and 900.

LOLL **Lower Limit Value**
Can be adjusted between lower scale and upper scale that is specified with *ctrr* parameter.
This parameter can't be higher than (*UPLL* - *HYSU* - *HYSL*) value.

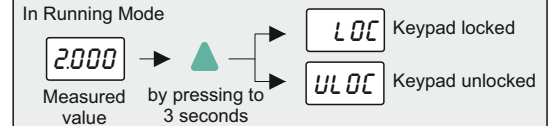
HYSL **Hysteresis Value for Lower Limit**
Can be adjusted between 0 and *ctrr 15*. This parameter can't be higher than (*UPLL* - *LOLL* - *HYSU*) value. When *ctrr* is changed, *HYSU* gets the value of 0.1.

dLYL **Delay Time for Lower Limit Alarm**
Can be adjusted between 0 and 900 seconds.

SDLY **Delay Time for Initial Upper Limit Alarm**
Can be adjusted between 0 and 900 seconds.

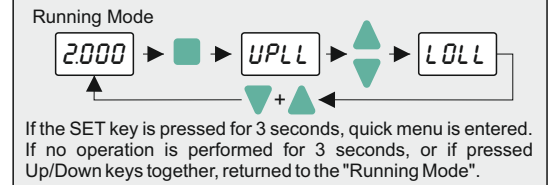
i This menu available for specified devices with "R" (RELAY) in order code only. Please check "Output Type" in the order code.

KEY LOCKING DIAGRAM



To locking or unlocking the keypad, key is pressed for 3 seconds in "Running Mode". *LOC* or *unL* message will appear for valid status. *LOC* message appears on display if one of the keys is pressed (except) when the keypad is locked.

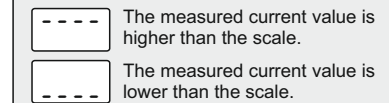
QUICK MENU



REVISION NUMBER



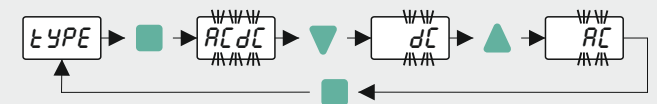
ERROR MESSAGES



FACTORY DEFAULTS

Power-up the device by pressing and holding down the key for factory defaults. *dPr* message will be displayed if the operation success.

SETTING UP THE PARAMETERS

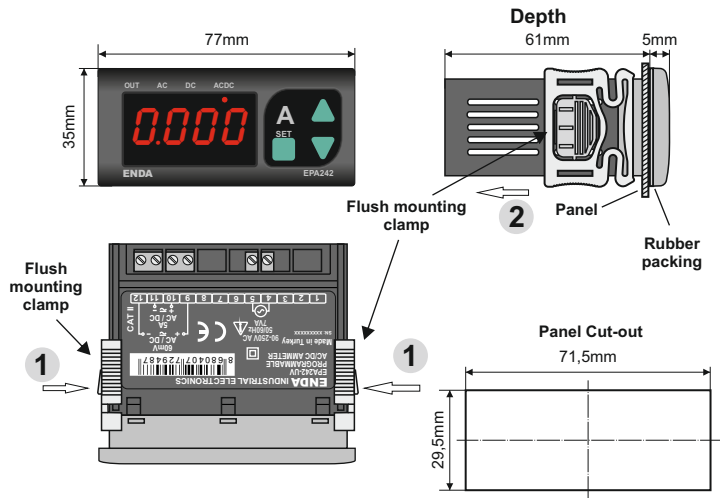


- If **SET** key is pressed, the current value of the parameter appears by flashing on the display.
- By using "UP" or "DOWN" navigation keys, selected parameter can be adjusted to the desired value.
- After the setting up the parameters, if set key is pressed again, adjusted parameter name appears on display.



NOTE : At first, *dPnt* parameter must be selected and next, the relay parameters must be set. *UPLL*, *LOLL*, *HYSU* and *HYSL* values must be checked when *dPnt*, *TYPE* and (if applicable) *ITYP* parameters are changed.

DIMENSIONS and CONNECTION DIAGRAM

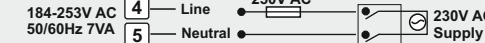


To removing mounting clamps :
 - Push the flush-mounting clamps in direction **1** as shown in the figure below. Then, pull out the clamp in direction **2**.

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.

NOTE :

SUPPLY:



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.

⚠ Fuse should be connected. Cable size: 1,5mm²



Equipment is protected throughout by **DOUBLE INSULATION**



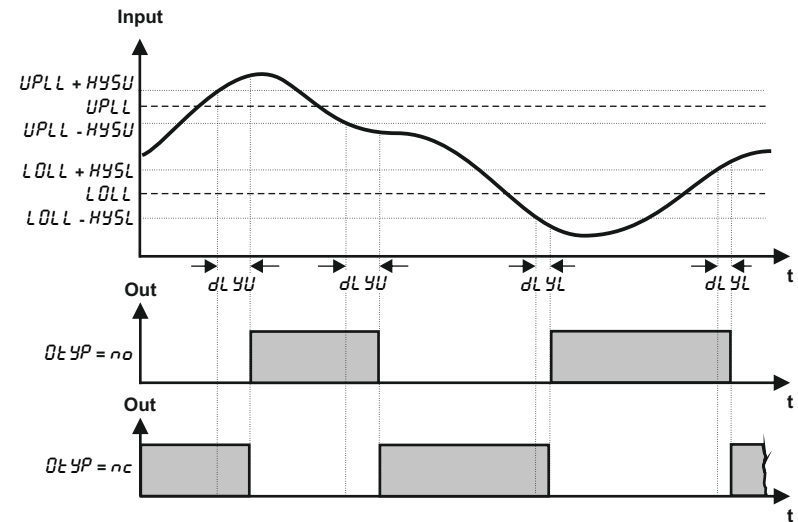
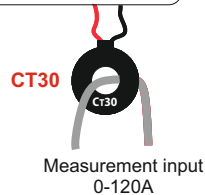
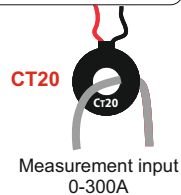
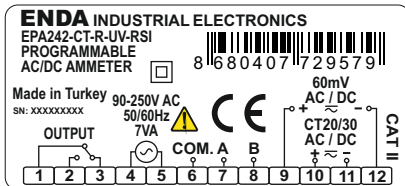
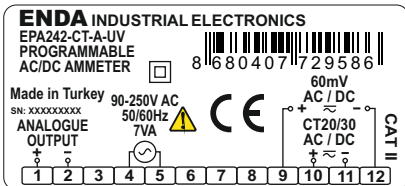
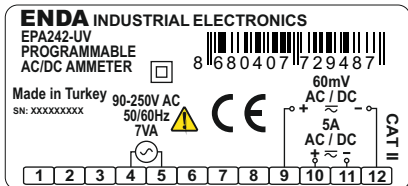
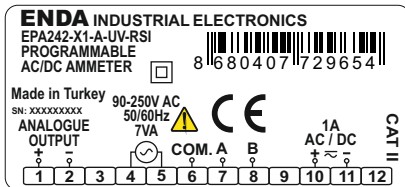
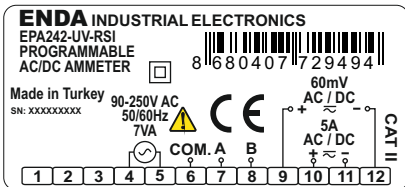
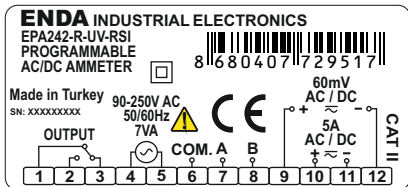
Holding screw 0.4-0.5Nm.



EPA242 is intended for installation in control panels. Device must be used to according to instructions. Mounting and 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.



CAUTION : The measurement will be incorrect when 5A / CT20-30 and 60mV inputs are connected at the same time.



	RC	dL	RC dL (rms)
	$A \frac{1}{\sqrt{2}}$	0.000	$A \frac{1}{\sqrt{2}}$
	A	0.000	A
	$A \frac{1}{\sqrt{3}}$	0.000	$A \frac{1}{\sqrt{3}}$

Please see page 5 for Modbus Connection Diagram

ENDA EPA242-CT-A-xxx-RSI DIGITAL AMMETER MODBUS PROTOCOL ADDRESS MAP

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	Current replacement rate	<i>ctrr</i>	R / W	5
0001d	0x0001	word	Measurement method (0=AC, 1=dC, 2=ACdC)	<i>type</i>	R / W	ACdC
0002d	0x0002	word	Decimal point. (0=0, 1=0.0, 2=0.00, 3=0.000)	<i>dpnt</i>	R / W	0.00
0003d	0x0003	word	Sampling time of the measurement value. (1 = 250ms , 2 = 500ms , 3 = 750ms , 4 = 1sn)	<i>optn</i>	R / W	4
0004d	0x0004	word	Device address for RS485 network connection. (Adjustable between 1-247).	<i>adr5</i>	R / W	1
0005d	0x0005	word	Baudrate (0=0FF, 1= 1200, 2=2400, 3=4800, 4=9600, 5= 19200, 6=38400, 7=57600, 8= 115200)	<i>baud</i>	R / W	0FF
*0006d	0x0006	word	Input Type. (0= CT20, 1= CT30, 2= SHnt)	<i>ityp</i>	R / W	CT20
*0007d	0x0007	word	Number of windings for transformer	<i>turn</i>	R / W	1
**0008d	0x0008	word	Analog output Type (0=0-20mA, 1=4-20mA, 2=0-10V, 3=1-5V)	<i>atyp</i>	R / W	0-20

* 6d and 7d addresses are available for only in CT20/30 input type devices.
** Address 8d is available for only in "A" (Analog) input type devices.

ENDA EPA242-CT-R-xxx-RSI DIGITAL AMMETER MODBUS PROTOCOL ADDRESS MAP

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	OUT1 output status	<i>otyp</i>	R / W	no
0001d	0x0001	word	Current replacement rate	<i>ctrr</i>	R / W	5
0002d	0x0002	word	The upper limit of the setpoint	<i>upll</i>	R / W	5.00
0003d	0x0003	word	The upper limit of the hysteresis value	<i>hysu</i>	R / W	0.10
0004d	0x0004	word	Delay time for the upper limit alarm	<i>dlYu</i>	R / W	0
0005d	0x0005	word	The lower limit of the setpoint	<i>loll</i>	R / W	0.00
0006d	0x0006	word	The lower limit of the hysteresis value	<i>hysl</i>	R / W	0.10
0007d	0x0007	word	Delay time for the lower limit alarm	<i>dlYl</i>	R / W	0
0008d	0x0008	word	Measurement method (0=AC, 1=dC, 2=ACdC)	<i>type</i>	R / W	ACdC
0009d	0x0009	word	Decimal point (0=0, 1=0.0, 2=0.00, 3=0.000)	<i>dpnt</i>	R / W	0.00
0010d	0x000A	word	Sampling time of the measurement value. (1 = 250ms , 2 = 500ms , 3 = 750ms , 4 = 1sn)	<i>optn</i>	R / W	4
0011d	0x000B	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>adr5</i>	R / W	1
0012d	0x000C	word	Baudrate (0=0FF, 1= 1200, 2=2400, 3=4800, 4=9600, 5= 19200, 6=38400, 7=57600, 8= 115200)	<i>baud</i>	R / W	0FF
0013d	0x000D	word	Delay Time for Initial Upper Limit Alarm	<i>sdly</i>	R / W	0
*0014d	0x000E	word	Input type. (0= CT20, 1= CT30, 2= SHnt)	<i>ityp</i>	R / W	CT20
*0015d	0x000F	word	Number of windings for transformer	<i>turn</i>	R / W	1

*14 and 15 addresses are available for only in EPA242-CT-R-xxx-RSI input type devices.

ENDA EPA242-xx-x-xxx-RSI INPUT REGISTERS FOR OUTPUT DEVICES

Input Register Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured current value	--	Read Only
0001d	0x0001	word	Decimal point of measured current value	--	Read Only

ENDA EPA242-CT-R-xxx-RSI DISCRETE INPUTS FOR OUTPUT TYPE UNIT "R" (RELAY) DEVICES

Discrete Input Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	Bit	Relay output state ($\bar{0}$ =OFF; 1 =ON)	--	Read Only

ENDA EPA242-CT-R-xxx-RSI COILS FOR OUTPUT TYPE UNIT "R" (RELAY) DEVICES

Coil Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	Bit	Output state ($0=nc$; $1=no$)	$\bar{0}tYP$	Read Only	nc

Not 1 : Coil and Discrete input parameters are not available in the devices those have no relay

Not 2 : $\bar{0}tYP$ menu parameters can be used as "Holding Register" or "Coil."

Not 3 : Value read in 0th address of input register gives the measured value. Also, the 1st address of the input register specifies the decimal part of the measured current value.

For example ;

Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 1, it is 284.2

Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 2, it is 28.42

Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 3, it is 2.842

* MODBUS CONNECTION DIAGRAM

