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 the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

ENDA EPA742 Programmable AC/DC Ammeter

Thank you for choosing **ENDA EPA742** programmable AC/DC ammeter.

- 72 x 72mm sized.
- 4 digits display.
- 5A/60 mV , CT20/30 current transformer or 1A input feature (Please Specify at Order). ⚠
- Measuring type can be selected as AC, DC or True RMS.
- Programmable scale range between 5A and 9999A.
- Multifunctional alarm output (NO) for upper and lower limits (Optional).
- 0-20mA, 4-20mA, 0-10V or 1-5V output selection (Optional - Specified devices with output type as 'A' only).
- Three-way isolation architecture between input, output and supply.
- Communication feature over isolated Modbus RTU protocol (Optional).
- Keylock feature.
- CE marked according to European Norms.

⚠ **CT20/30 should be ordered separately when required.**

Order Code : EPA742 - □□ - □□ - □ - □□□
(1 - 2 - 3 - 4)

1 - Supply Voltage	2 - Input Type	3 - Output	4 - Isolated Modbus
UV....90-250V AC LV.....10-30V DC / 8-24V AC	CT.....CT20/30 Current Transformer input OR 60mV. X1.....1A Default (Blank).....5A or 60mV.	R.....08A Relay	RSI.....RS485 Modbus Available (Specify at order)

CE RoHS Compliant

INPUTS		
Input Type		EPA742-UV : 5A or 60mV EPA742-UV-CT : CT20/30 current transformer or 60mV EPA742-UV-X1 : 1A
Scale	**AC and RMS**	**If input type is 5A / 60mV, scale 0A...9999A :** (Specified by c.trr parameter. i.e : scale is 0A...5A for c.trr = 5)
		If input type is 1A, scale 0A...9999A : (Specified by c.trr parameter. i.e : scale is 0A...1A for c.trr = 1)
		If input type is CT20/30 / 60mv : If ityP = Ct20 , 0A...300A or Ct30 , 0A...120A (Specified by turn parameter. i.e : scale is 0A..300A / 0A..120A for turn = 1) If ityP = SHnt , 0A...9999A (Specified by c.trr parameter. i.e : scale is 0A...5A for c.trr = 5)
	DC	**If input type is 5A / 60mV, scale :** -999A...9999A (Specified by c.trr parameter. i.e : scale is -5A...5A for c.trr = 5)
		If input type is 1A, scale : -999A...9999A (Specified by c.trr parameter. i.e : scale is -1A...1A for c.trr = 1)
		If input type is CT20/30 / 60mV : **DC measurement can not be performed by using CT.** **If** ityP = SHnt **, scale :** 0A...9999A (Specified by c.trr parameter. i.e : scale is -5A...5A for c.trr=5)
Sensitivity		0.002A x c.trr (i.e. : 0.01A for c.trr = 5)
Accuracy	**AC/RMS**	±%1 (full scale) (± 2% For square wave form)
	DC	±%1 (full scale)
Input Range		Input type 60V ; -60mV...60mV ⚠ **(Device may be damaged at 50V and above voltages)** Input type 1A ; -1A...1A ⚠ **(Device may be damaged at 2A and above currents)** Input type 5A ; -5A...5A ⚠ **(Device may be damaged at 10A and above currents)** Input type CT20/30 ; 0 ... 150 mA
Input Impedance		20kΩ for 60mV Input, 90mΩ for 1A Input, 12mΩ for 5A Input, 600mΩ for CT20/30 Input.
Frequency Range		DC , 20Hz - 70Hz

ELECTRICAL CHARACTERISTICS	
Supply	90-250V AC 50/60Hz ;10-30V DC / 8-24V AC 50/60Hz SMPS
Power Consumption	Max. 7VA
Wiring	2.5mm² screw-terminal connections
EMC	EN 61326-1: 2013
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

OUTPUTS	
Output	Relay : 250V AC, 8A (for resistive load), NO (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 for current outputs Max. 500Ω). 0-10V DC or 1-5V DC, Max. 10mA. ±0,5% (Short circuit protected).

ENVIRONMENTAL CONDITIONS	
Ambient/Storage Temperature	0 ... +50°C/-25 ... 70°C (should be no icing or condensation in the environment)
Max. Relative Humidity	80% Relative humidity for temperatures up to 31°C, decreasing linearly to 50% at 40°C (should be no icing or condensation in the environment).
Rated Pollution Degree	IP20 According to EN 60529
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 EN60715 Standards, TH35 rail type.
Dimensions	W72xH72xD94mm
Weight	Approx. 350g (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.

SİSEL MÜHENDİSLİK ELEKTRONİK SAN. VE TİC. A.Ş.
Şerifali Mah. Barbaros Cad. No:18 Y.Dudullu 34775
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url : www.enda.com.tr

EPA742 PROGRAMMING DIAGRAM

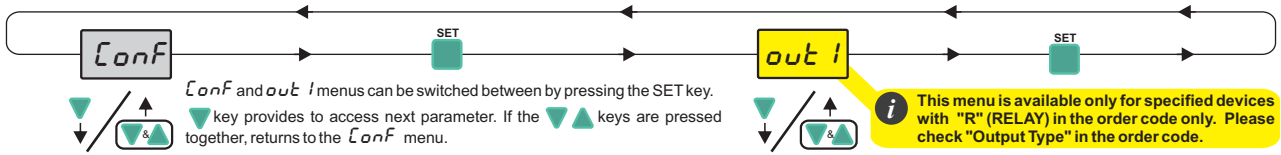
Increment key ▲ Used for increasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value increases faster.

Decrement key ▼ Used for decreasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value decreases faster.

Programming key SET Used for displaying and configuring the selected parameter value.

▲&▼ By pressing to ▲▼ keys together for 3 seconds, xcxcxc message appears and the "Programming Mode" is entered. If the ▲▼ keys are pressed during "Programming Mode" or no operation is performed for 3 seconds, returns to the "Running Mode".

PROGRAMMING MODE



conF and out 1 menus can be switched between by pressing the SET key.

▼ key provides to access next parameter. If the ▼▲ keys are pressed together, returns to the conF menu.

c.trr Current Conversion Ratio
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

tYPE Measuring Method
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).
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).
dPnt type may change according to relay parameters value.

oPtn Samping 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.

Adr5 Device Address
Can be adjusted between 1-247 .

bAUd Baud Rate
It can be adjusted as oFF, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

itYP Input Type (In devices with input type "CT")
Can be adjusted to Ct20 , Ct30 , Shnt values.
⚠ **If Shnt is selected, 60mV input terminals must be used. Terminal inputs : 9 and 12**

turn Number of Windings (In devices with input type "CT")
Number of windings of the current cable getting through the CT20/30 current transformer.
Please see "CT20/30 Current Transformer & Windings" chart on the right side of this page.

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

out 1 ▲&▼

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

otYP Out1 Output State
It can be adjusted as n.o. or n.c. If n.o is selected, incase of alarm, out relay is activated.

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

HYSU Hysteresis Value for Upper Limit
It can be adjusted between 0 and ctrr /5 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
It can be adjusted between 0 and 900 .

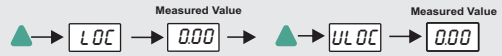
LoLL Lower Limit Value
It can be adjusted between lower scale and upper scale that is specified with c.trr parameter.
This parameter can't be higher than (UPLL - HYSU - HYSL) value.

HYSL Hysteresis Value for Lower Limit
It can be adjusted between 0 and Ctrr /5 .
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
It can be adjusted between 0 and 900 seconds.

SdLY Delay Time for Initial Upper Limit Alarm
It can be adjusted between 0 and 900 seconds.

LOCKING & UNLOCKING KEYPAD



In "Running Mode" , by pressing to ▲ key for 3 seconds, keypad locked or unlocked.

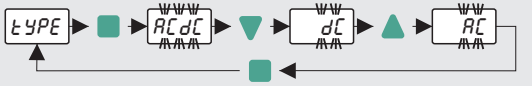
QUICK MENU

By pressing to SET key for 3 seconds, quick menu is entered.

REVISION NUMBER

SET & ▲ & ▼ If these keys are pressed and held together, revision date appears as day, month and year.
While revision information displayed and if one of the pressed key is released, measured value is displayed again.

SETTING UP THE PARAMETERS



SET 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.
SET After the setting up the parameters, if set key is pressed again, adjusted parameter name appears on display.

DEFAULT SETTINGS

⚠ **Powered on device by pressing ▼ key. dPAr message appears on display and device resets to default settings.**

ERROR MESSAGES

---- Measured current value is higher than maximum scale.

____ Measured current value is lower than minimum scale.

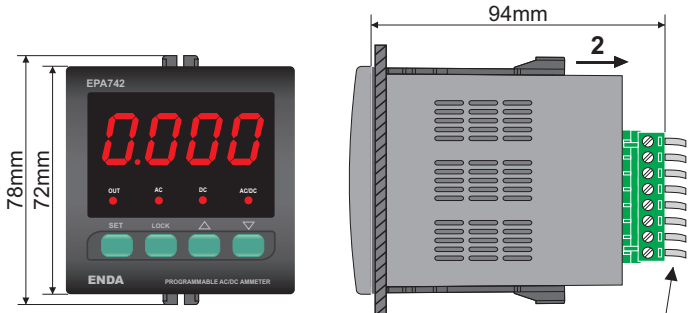
CT20/30 Current Transformer & Windings Chart

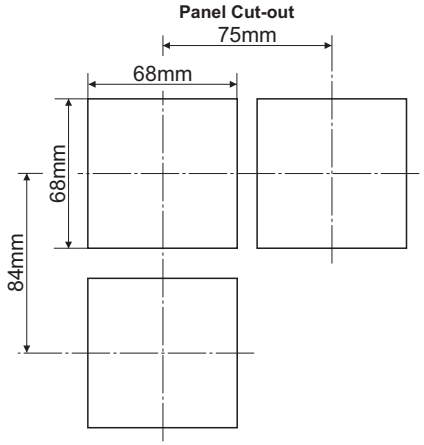
	turn	1	2	3	4	5	6	7	8	9	10
CT20	Iin max(A)	300	150	100	75	60	50	42,8	37,5	33,3	30
CT30	Iin max(A)	120	60	40	30	24	20	17,1	15	13,3	12

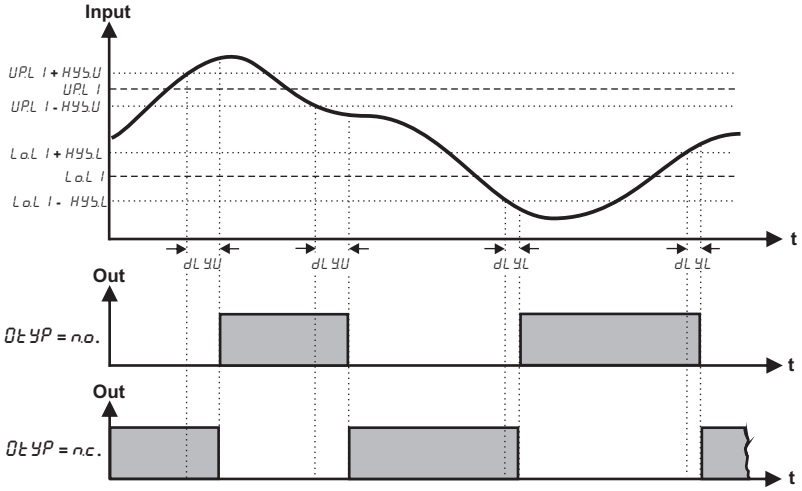
⚠ **Note :**
If itYP parameter set to Shnt , turn parameter is not appears.
If itYP parameter set to Ct20 or Ct30 , ctrr parameter is not appears.

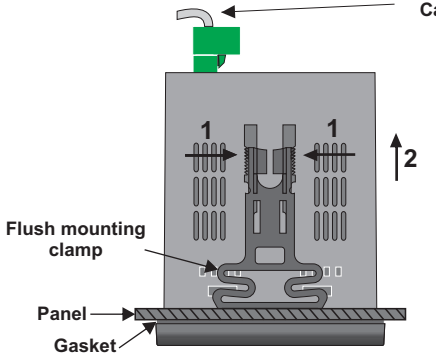
Note :
Before setting the relay parameters, the operating scale must be determined from dPnt parameter.
If dPnt , tYPE and itYP parameters are changed (if applicable), UPLL , LoLL , HYSU and HYSL values must be checked.

DIMENSIONS & CONNECTION DIAGRAM



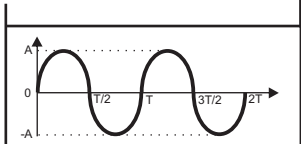
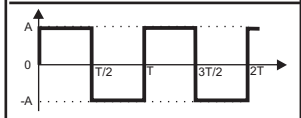
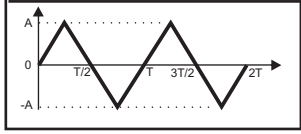






For removing mounting clamps :
- Push the flush-mounting clamp in direction **1** as shown in the figure left.
- Then, pull out the clamp in direction **2.**

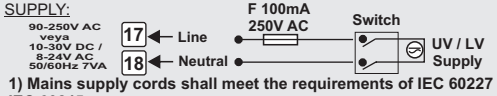
Note :
1) Panel thickness should be maximum 10mm.
2) There must be at least 90mm free space behind the device, otherwise it would be difficult to remove it from the panel.

	Ac	dc	Ac.dc (rms)
	$A\frac{1}{\sqrt{2}}$	0.000	$A\frac{1}{\sqrt{2}}$
	A	0.000	A
	$A\frac{1}{\sqrt{3}}$	0.000	$A\frac{1}{\sqrt{3}}$

ENDA EPA742 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 :
Only one of the 60mV or 5A/CT20-30 inputs can be used.

NOTE :
SUPPLY:

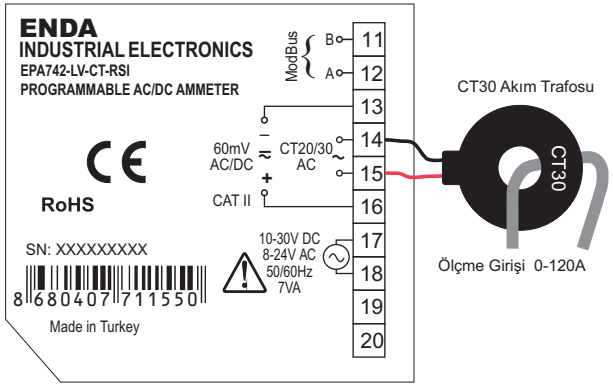


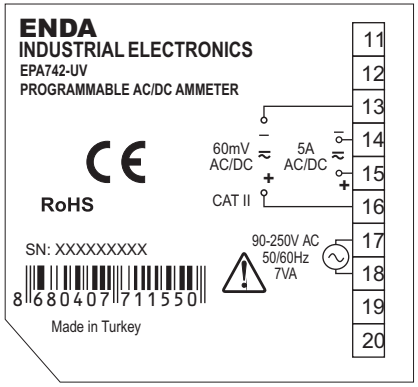
1) Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

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

Equipment is protected throughout by DOUBLE INSULATION

Holding screw 0.4-0.5Nm.





Please see page 5 for Modbus Connection Diagram

ENDA EPA742-xx-x-xx DIGITAL AMPERMETER WITH ANALOGUE OUTPUT MODBUS PROTOCOL ADDRESS MAP						
Holding Register Adresleri		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	Current Conversion Ratio	ctrr	R / W	5
0001d	0x0001	word	Measurement method (0=AC, 1=dC, 2=ACdC)	tYPE	R / W	ACdC
0002d	0x0002	word	Decimal point (0 = 0 , 1 = 0.0 , 2 = 0.00 , 3 = 0.000)	dPnt	R / W	0.00
0003d	0x0003	word	Sampling time of the measurement value	oPtn	R / W	4
0004d	0x0004	word	Device address for RS485 network connection. Adjustable between 1-247.	AdrS	R / W	1
0005d	0x0005	word	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200)	bAUd	R / W	oFF
*0006d	0x0006	word	Input Type (0 = Ct20 , 1 = Ct30 , 2 = SHnt)	ityP	R / W	Ct20
*0007d	0x0007	word	Number of windings for transformer (Can be set between 1 and 10).	turn	R / W	1
⚠ * 6d and 7d addresses are available for only in EPA742-xx-CT-x-RSI CT20/30 input type devices.						

ENDA EPA742-xx-xx-R-RSI DIGITAL AMPERMETER WITH ALARM RELAY OUTPUT MODBUS PROTOCOL ADDRESS MAP						
Holding Register Adresleri		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	Alarm output status	OtyP	R / W	no
0001d	0x0001	word	Current replacement rate	ctrr	R / W	5
0002d	0x0002	word	The upper limit of the setpoint	UPLL	R / W	5.00
0003d	0x0003	word	The upper limit of the hysteresis value	HYSU	R / W	0.10
0004d	0x0004	word	Delay time for the upper limit alarm	dLYU	R / W	0
0005d	0x0005	word	The lower limit of the setpoint	LOLL	R / W	0.00
0006d	0x0006	word	The lower limit of the hysteresis value	HYSL	R / W	0.10
0007d	0x0007	word	Delay time for the lower limit alarm	dLYL	R / W	0
0008d	0x0008	word	Measurement method (0=AC, 1=dC, 2=ACdC)	tYPE	R / W	ACdC
0009d	0x0009	word	Decimal point. (0 = 0 , 1 = 0.0 , 2 = 0.00 , 3 = 0.000)	dPnt	R / W	0.00
0010d	0x000A	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.	OPtn	R / W	4
0011d	0x000B	word	Device address for RS485 network connection. Adjustable between 1-247.	AdrS	R / W	1
0012d	0x000C	word	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200)	bAUd	R / W	oFF
0013d	0x000D	word	Delay Time for Initial Upper Limit Alarm	SdLY	R / W	0
*0014d	0x000E	word	Input Type (0 = Ct20 , 1= Ct30 , 2 = SHnt)	ityP	R / W	Ct20
*0015d	0x000F	word	Number of windings for transformer	turn	R / W	1
⚠ *14. and *15. addresses are only used in devices with EPA742-xx-xx-R-RSI, input type CT20/30 current transformer.						

ENDA EPA742-xx-xx-x-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 EPA742-xx-xx-R-RSI DIGITAL AMPERMETER WITH ALARM RELAY OUTPUT 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)	--	Read Only

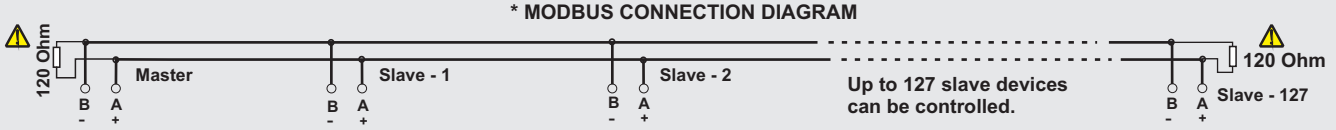
ENDA EPA742-xx-xx-R-RSI DIGITAL AMPERMETER WITH ALARM RELAY OUTPUT COILS INPUTS						
Coil Addresses		**Data Type**	**Data Content**	**Parameter Name**	**Read/Write Permission**	**Default Value**
Decimal	**Hex**					
00d	0x00	Bit	Output state (0=no; 1=nc)	OtyP	R / W	no

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

⚠ **Note 2 :** OtyP menu parameters can be used as “Holding Register” or “Coil.

⚠ **Note 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**



⚠ **Termination should be accomplished by attaching 120 Ohm resistors to the start and at the end of the communication line.**

**** Applies to devices with Modbus function.***