



Please read this document carefully before using this product. The guarantee will be invalidated if the device is damaged by not following instructions detailed in the manual. The company shall not be responsible for any damage or losses however caused, which may be experienced as a result of the installation or use of this product.

## ENDA ERPA1 Series Power Regulators

Thank you for choosing ENDA ERPA1 Series power regulators.

- \* 40A-50A-70A AC Load current.
- \* 280V-480V-500V AC Load voltage.
- \* 0/4-20mA, 0/1-5V DC, 0/2-10V DC or 1kΩ ~ 10kΩ Potentiometer input.
- \* 4 Digits LED display.
- \* Phase angle or zero-cross controlled.
- \* Soft Start or Kick Start feature.
- \* Overheat alarm output.
- \* Varistor protection for peak voltages.
- \* Vibration coil control (Optional).
- \* RS485 ModBus Communication feature (Optional).
- \* CE Marked according to European Norms.

### ORDER CODE ERP A 1 - 5 50 - F - V - RS

<b>Product Basic Code</b>		<b>Communication (*)</b>	
Rail Mounted	ERP	RS485 ModBus	RS
<b>Load Voltage</b>		Blank (N/A)	***
AC	A	<b>Vibration Control (*)</b>	
<b>Number of Pole</b>		Vibration Control	V
Single pole	1	Blank (N/A)	***
<b>Load Voltage</b>		<b>Fan (*)</b>	
180 - 280V AC	2	Fan	F
180 - 480V AC	4	<b>Load Current</b>	
180 - 500V AC	5	40A AC	40
		50A AC	50
		70A AC	70



**CE** **RoHS Compliant**

(\* ) Optional features must be specified at order.

ENVIRONMENTAL CONDITIONS	
Ambient/storage temperature	-25... +60 °C / -30... +100 °C (Shouldn't be icing and condensation in ambient.)
Relative humidity	90% Relative humidity for temperatures up to 20 °C, decreasing linearly to 50% at 40°C. (Shouldn't be condensation).
Pollution degree	2
Overvoltage category	II
Altitude	Max. 1000m.
Protection	IP20 According to EN60529

**⚠ KEEP AWAY** device from exposed to corrosive, volatile and flammable gases or liquids and **DO NOT USE** the device in similar hazardous locations.

OUTPUT				
Order Code	ERPA1-240-F	ERPA1-440-F	ERPA1-550-F	ERPA1-570-F
Load Current, AC51/25°C (Arms)	40	40	50	70
Load Voltage (Vrms)	180 - 280	180 - 480	180 - 500	180 - 500
Overload Current t=1s/25°C (Arms)	150	110	180	400
Non rep. Surge current/25°C (Arms)	400	290	270	600
On-state Voltage Drop (Vrms)	1,6	1,8	1,8	1,8
Leakage Current (mArms)	5	8	10	15
I <sup>2</sup> t for Fusing t=10ms (A <sup>2</sup> s)	880	610	720	4000
Frequency (Hz)	50 - 60	50 - 60	50 - 60	50 - 60
Power Factor (CosΦ)	>0,75	>0,75	>0,75	>0,75
Minimum Operating Current (mArms)	160	200	300	400
Alarm Output	3A, 250V AC, NO or NC can be selected by program.			

INPUT	
Input Signal	0/4-20mA, 0/1-5V DC, 0/2-10V DC or 1kΩ ~ 10kΩ potentiometer. (Device may be damaged at 12V DC and above voltages).
Transmission Signal	≥0,2mA (for mA input), ≥0,08V (for V input).
Drop-out Signal	≤0,18mA (for mA input), ≤0,075V (for V input).
Turn-on Time	15ms.
Dynamic Input Impedance	≤100Ω (for mA input), ≥10kΩ (for V input).
Protection	Protection feature for reverse connection is available.

GENERAL	
Order code	ERPA1-xxx-F-xx
Power supply	90-250V AC, 50/60Hz.
Dimensions	W46 x H110 x D117mm (for ERPA1-x40-F and ERPA1-550-F), W79 x H120 x D132mm (for ERPA1-570-F).
Weight	Approx. 450g (for ERPA1-x40-F and ERPA1-550-F), Approx. 550g (for ERPA1-570-F) (boxed).
Isolation Voltage	2500 Vrms between I/O terminals for 1 min.
Connection	For power line 16mm <sup>2</sup> cable (with 25mm <sup>2</sup> cable terminal) cable, for signal line can be connected 4mm <sup>2</sup> cable.
Terminal screw torque	Max. 1,2Nm.
Product standard	EN 60947-4-3
Mounting	Rail mountable (EN60715, TH35 or G-32).
Enclosure material	Self extinguishing plastics (According to EN 60695-11-10 V-0).
Fan (Optional)	Fan is controlled with thermostat and works at temperatures over 50°C.

**⚠ Avoid any liquid contact while the device is switched on. DO NOT clean the device with solvent (thinner, gasoline, acid etc.) and / or abrasive cleaning agents.**



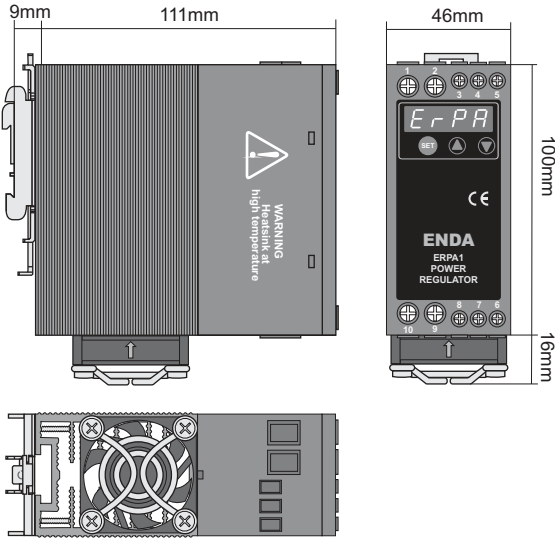
SİSEL MÜHENDİSLİK ELEKTRONİK SAN. VE TİC. A.Ş.  
Şerifali Mah. Barbaros Cad. No:18 Y.Dudullu 34775  
ÜMRANIYE/İSTANBUL-TURKEY  
Tel : +90 216 499 46 64 Pbx. Fax : +90 216 365 74 01  
url : www.enda.com.tr



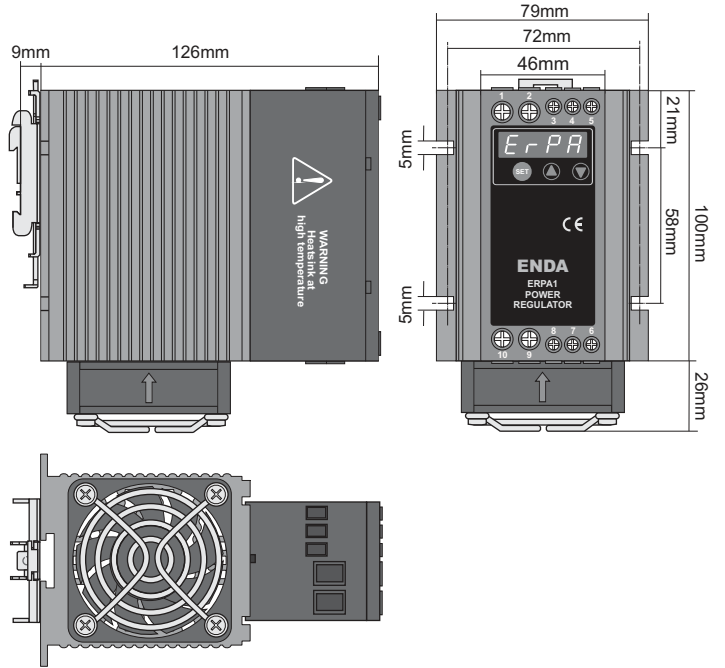
ERPA1-xxx-EN-06-210303

## DIMENSIONS

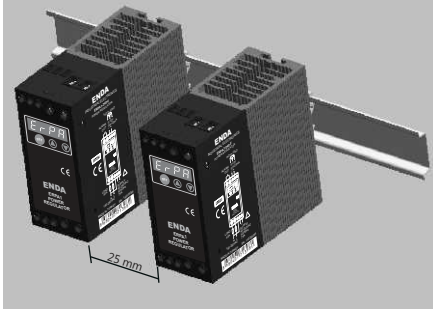
### ERPA1-240-F , ERPA1-440-F , ERPA1-550-F



### ERPA1-570-F



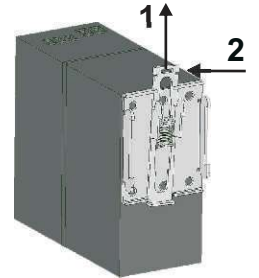
## INSTALLATION



While assembling, there must be at least 25mm clearance between the devices.

#### Mounting the device to the rail :

By using a screwdriver, lock the tab of the mounting bracket by pulling it upwards in direction 1 . Place the device on the rail and push the tab in direction 2 (sideways) to hold the device on the rail.

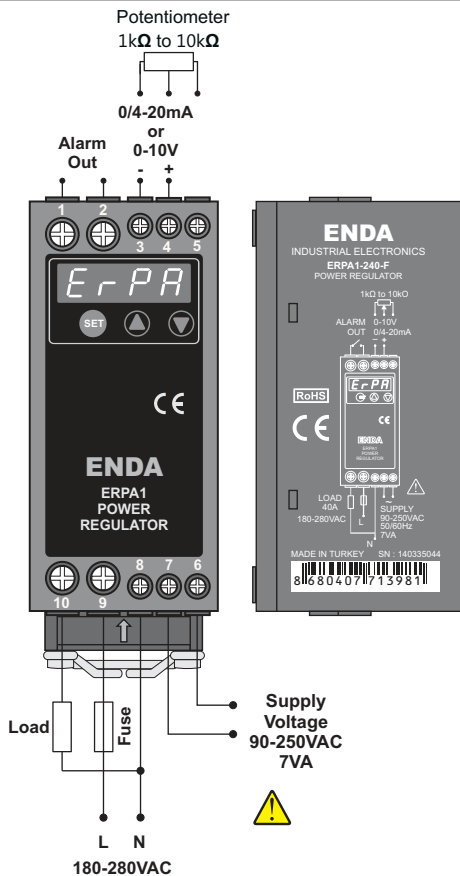


#### Removing the device from rail ;

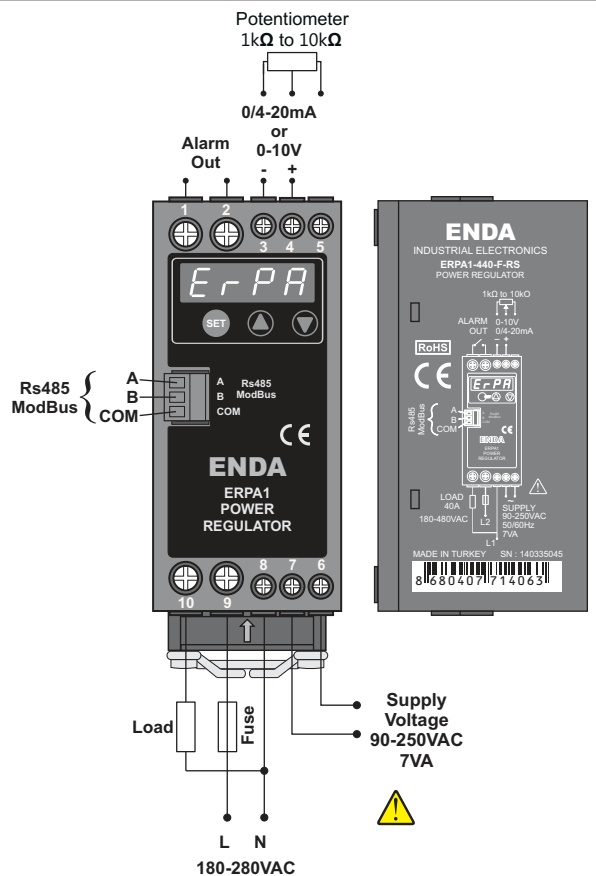
By using a screwdriver, lock the tab of the mounting bracket by pulling it upwards in direction 1 and pull the device from the rail.

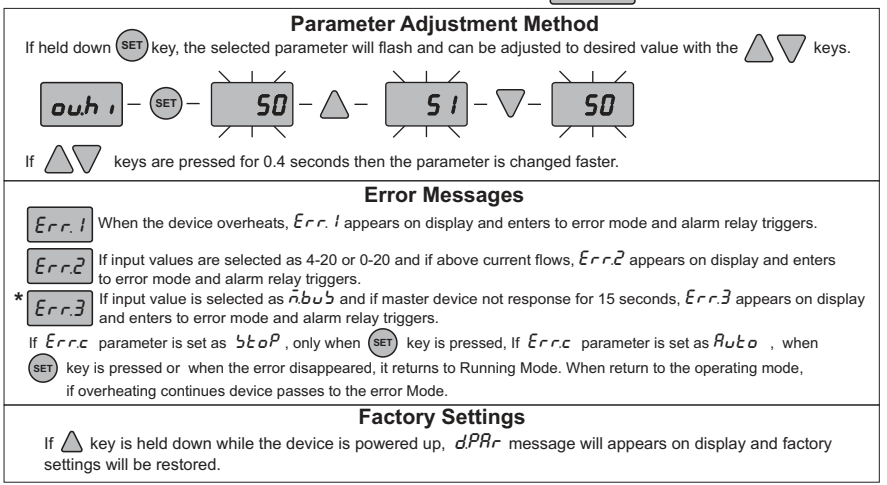
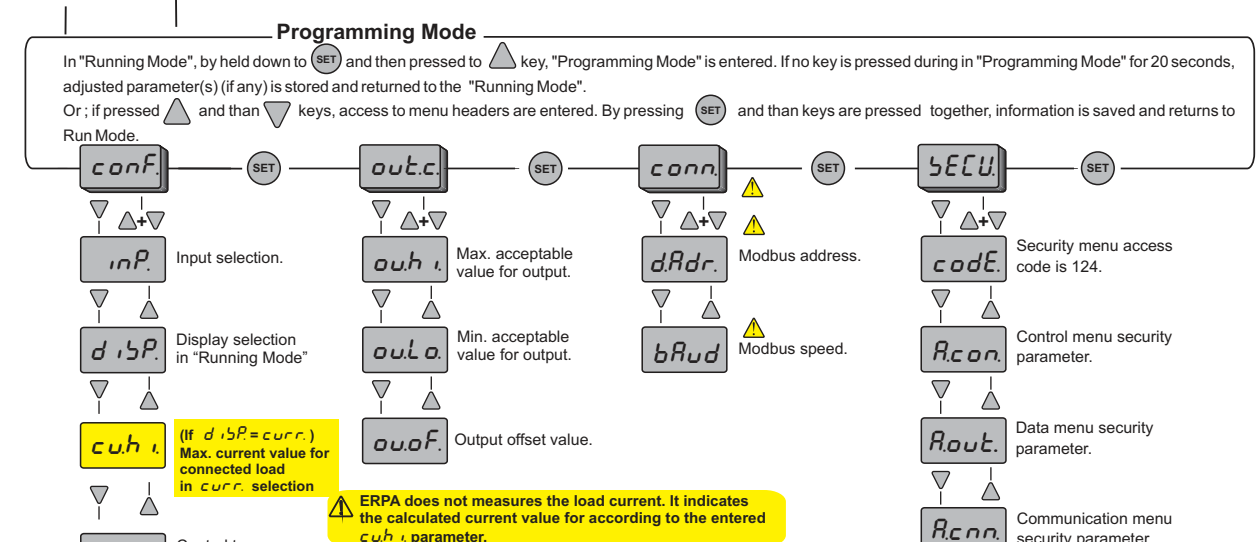
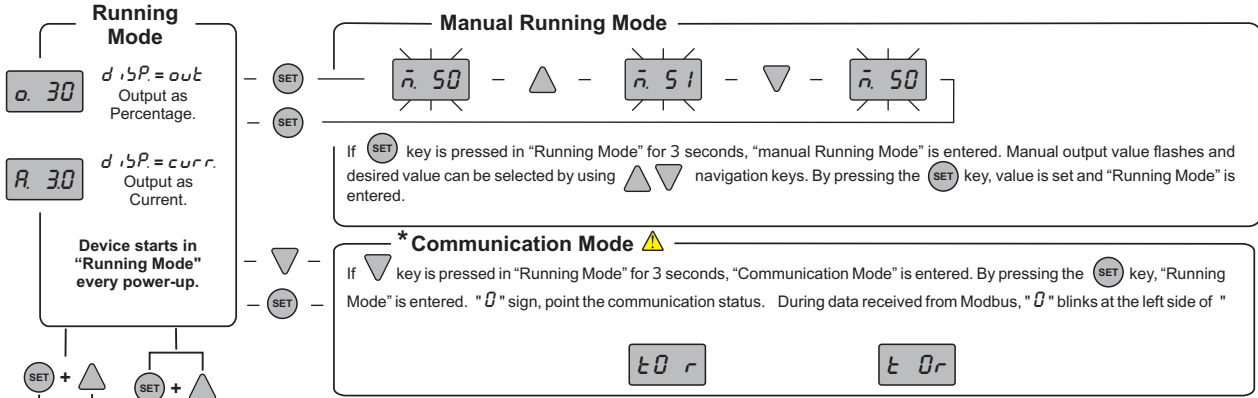
## APPLICATION

### ERPA1-240-F

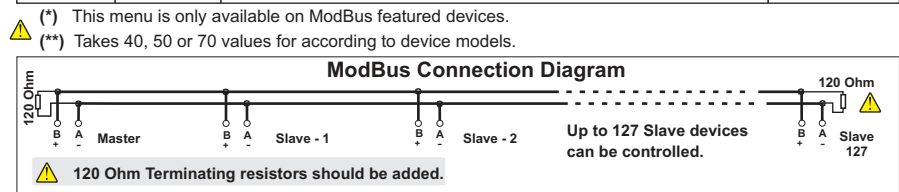


### ERPA1-440-F-RS



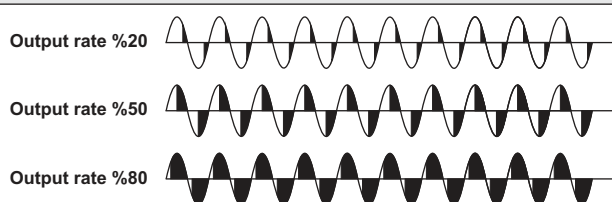


PARAMETER TABLE			
Parameter	Options / [units]	Description	Default values
<b>conf. Configuration menu</b>			
<b>inp.</b>	4-20	4-20mA	0-10
	0-20	0-20mA	
	0-10	0-10V	
	1-5	1-5V	
	2-10	2-10V	
	0-5	0-5V	
	Pot.	Potentiometer input.	
	$\bar{n}Run.$	Manual Run Mode.	
$\bar{n}bus.$	Modbus input		
<b>d.isP.</b>	out	Output as Percentage in Run Mode.	out
	curr.	Output as Current in Run Mode.	
<b>cu.h.i.</b>	[Ampere]	Takes a value between 0 and load current.	(**) $\Delta$
<b>ct.yP.</b>	PhAs.	Control with phase angle.	PhAs.
	croS.	Control with Zero-cross.	
<b>st.t.y.</b>	soFt	Output is energized with soft start.	soFt
	icSt.	Output is energized with kick start.	
	$\bar{n}St.$	Output is energized with soft start according to manual output value.	
	$\bar{n}icSt.$	Output is energized with kick start according to manual output value.	
<b>st.t.t.</b>	[Second]	Start duration (0 - 200).	4
<b>RLou.</b>	no.	Alarm relay normally open.	no.
	nc.	Alarm relay normally closed.	
<b>Err.c.</b>	Ru.to	Returns to Run Mode when error disappears.	Ru.to
	st.oP	Remains in Error Mode when error disappears.	
<b>ou.t.c. Output Control Menu</b>			
<b>ou.h.i.</b>	[%]	Takes a value between <b>ou.l.o.</b> and 100.	100
<b>ou.l.o.</b>	[%]	Takes a value between 0 and <b>ou.h.i.</b>	0
<b>ou.of.</b>	[%]	Takes a value between -50 and 50.	0
<b>conn. Communication Menu (*) <math>\Delta</math></b>			
<b>dAdr.</b>		Takes a value between 1 and 247.	1
<b>bAud.</b>		1200, 2400, 4800, 9600 and 19200 values are selectable.	9600
<b>SECU Security Menu</b>			
<b>R.con.</b>	nonE	Configuration menu invisible.	PYE5
	PYE5	Configuration menu can be changed.	
	P.no	Only configuration menu visible.	
<b>R.out.</b>	nonE	Output control menu invisible.	PYE5
	PYE5	Output control menu can be changed.	
	P.no	Only Output control menu visible.	
<b>R.cnn.</b>	nonE	Communication menu invisible.	PYE5
	PYE5	Communication can be changed.	
	P.no	Only communication menu visible.	



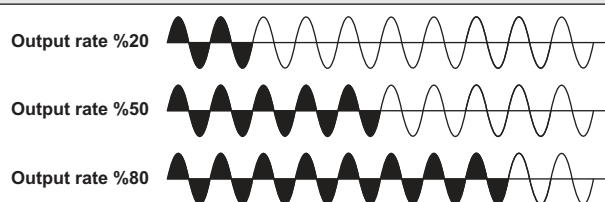
## Control Method

### With Phase Angle Control



It is a proportional control method used in inductive and variable resistive loads ( $\cos\theta < 1$ ). The disadvantage of this method is that it causes high electrical noise.

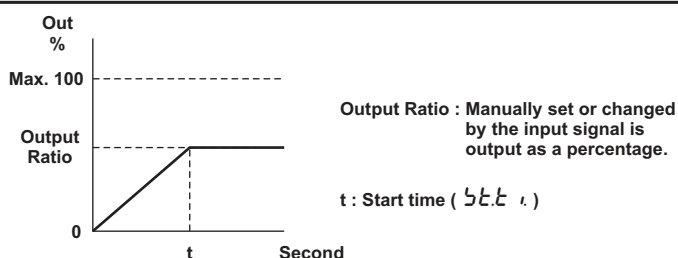
### With Zero-Crossing Control



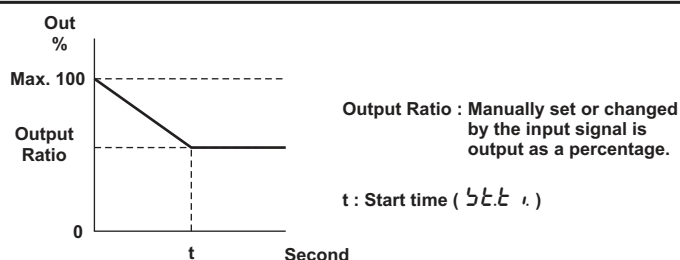
It is a control method used in capacitive and variable resistive loads ( $\cos\theta = 1$ ). The advantage of this method is that it does not cause high electrical noise.

## Start Method

### Soft Start



### Kick Start



## ENDA ERPA1 MODBUS PROTOCOL ADDRESS MAP

### 1.1 Memory Map for Holding Registers

Holding Register addresses Decimal (Hex)	Data type	Data content	Parameter Name	Read / Write permission
0000d (0000h)	Byte	Modbus input (adjustable between $ouLo$ and $ouHi$ ).	--	R / W
0001d (0001h)	Byte	Input selection (0: 4-20mA, 1: 0-20mA, 2: 0-10V, 3: 1-5V, 4: 2-10V, 5: 0-5V, 6: potentiometer, 7: manual, 8: Modbus).	<i>inp.</i>	R / W
0002d (0002h)	Byte	Display selection on Running Mode (0: output as percent, 1: output as current, 2: set manually in percent output).	<i>disP.</i>	R / W
0003d (0003h)	Byte	Start type selection. ( 0 : Soft Start according to input signal. 1 : Kick Start according to input signal. 2 : Soft Start according to manual output. 3 : Kick Start according to manual output ).	<i>st.ty</i>	R / W
0004d (0004h)	Byte	Kick-Soft start duration (adjustable between 0 and 200 seconds).	<i>st.t.</i>	R / W
0005d (0005h)	Byte	Max. acceptable value for output. (Acceptable between $ouLo$ and 100).	<i>ouHi</i>	R / W
0006d (0006h)	Byte	Min. acceptable value for output. (acceptable between 0 and $ouHi$ ).	<i>ouLo</i>	R / W
0007d (0007h)	Byte	Max. output current. (Acceptable value between 0 and load current).	<i>cuHi</i>	R / W
0008d (0008h)	Byte	Output offset value. (Adjustable between -50 and 50).	<i>ou.of.</i>	R / W
0009d (0009h)	Byte	Security parameter for configuration menu (0: Menu invisible, 1: Menu programmable 2: Only configuration menu visible).	<i>R.con.</i>	R / W
0010d (000Ah)	Byte	Output parameter for configuration menu (0: Menu invisible, 1: Menu programmable 2: Only configuration menu visible).	<i>R.out.</i>	R / W
0011d (000Bh)	Byte	Communication parameter for configuration menu (0: Menu invisible, 1: Menu programmable 2: Only configuration menu visible).	<i>R.cnn.</i>	R / W
0012d (000Ch)	Byte	Modbus device address (adjustable between 0 and 247).	<i>d.Adr.</i>	R / W
0013d (000Dh)	Byte	Modbus baud rate (0: 1200, 1: 2400, 2: 4800, 3: 9600, 4: 19200)	<i>bAud</i>	R / W

### 1.2 Memory Map for Coils

Coil addresses	Data Type	Data content	Parameter Name	Read / Write permission
(0000)h	Bit	Control selection type (0: Phase angel, 1: Zero-cross)	<i>ctYP.</i>	R / W
(0001)h	Bit	Alarm relay selection (0: NO, 1: NC)	<i>RLou.</i>	R / W
(0002)h	Bit	Alarm control management (0: Returns to Run Mode when error disappears., 1: Remains in Error Mode when error disappears.)	<i>Err.c.</i>	R / W

### 1.3 Memory Map for Input Registers

Input register address	Data Type	Data content	Parameter Name	Read / Write permission
(0000)h	Byte	Output value as percent	--	Only Readable
(0001)h	Byte	Current value as percent	--	Only Readable

Note : Modbus default Parity and Data Bits settings can not be changed. (Parity : None. Data Bits : 8)