

# ENERGY 11-DIN

# ENERGY 11-DIN 100a

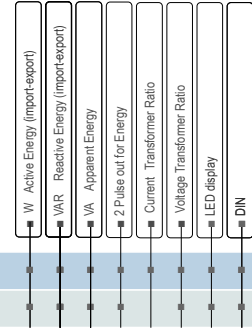


PARAMETERS:	ENERGY-11-DIN	ENERGY-11-DIN 100A
Ct : current transformer ratio (1...5000 )	_____	_____ With 100A current transformer
Ut : voltage transformer ratio (1...4000 )	_____	_____
PULS oUt : Pulse out	_____	_____
CLr : clear	_____	_____
rES ALL PAr : reset all values	_____	_____

## MODEL

ENERGY-11-DIN

ENERGY-11-DIN 100A



[www.kael.com.tr](http://www.kael.com.tr)

KAEL Mühendislik Elektronik Tic. ve San. Ltd.Şti.

### Introduction

The device was designed to measure, report and analyse the electrical magnitudes in the 3-phase electric network and both design and software were produced by Kael engineers. The state-of-the-art technologies were inserted in this device and both menus which facilitate the use of the user and the required features were included.

All the information and warnings you need to know concerning the device were described in the user operation manual. Please read this manual carefully before engaging with the device. Please do not take any action before consulting with our company for any matters not clearly understood.

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Factory: Atatürk Mh. 78. Sok. No:10 Ulucak Köyü Kemalpaşa İzmir- TURKIYE

### WARNINGS

- 1- The device shall be engaged by competent and licensed persons in conformity with the instructions set forth in the operation manual. In case required, controls shall be carried out by such persons also.
- 2- Do not open the inside of the device or cause to be opened. There are no parts inside the device which the user or anyone else may intervene.
- 3- Use the device according to assembly instructions
- 4- Before making electrical connection to the terminals of the device, make sure there is no electric power on the cables and terminals. The switchboard shall not have electric power on.
- 5- The fuses used in the device are of 1A FF type.
- 6- Make sure to fix the device on the switchboard firmly without swings with the apparatus given with the device.
- 7- Do not touch the keys on the front panel of the device with any substance other than your finger.
- 8- Wipe the device only with dry cloths after making sure the electric energy of the device is cut-off. Water or chemicals used for cleaning may cause damage to the device.
- 9- Before activating (energizing) your device please make sure that the terminal connections are made according to the connection scheme and without causing any contact problems (loose connection or contact of multiple copper cables).
- 10- The above measurements and warnings are for your safety. Kael Elektronik Ltd Şti or the dealer may not be held liable for any inconveniences when those warnings are not observed.

### Features

- Easy use with menu
- Improved dynamic software
- Ability to enter current and voltage transformer rates
- True RMS
- Password protection

### Measurements

- Active Energy ( $\Sigma kWh$ )
- Inductive Reactive Energy ( $\Sigma kVARh(ind)$ )
- Capacitive Reactive Energy ( $\Sigma kVARh(cap)$ )
- Apparent Power ( $\Sigma kSh$ )

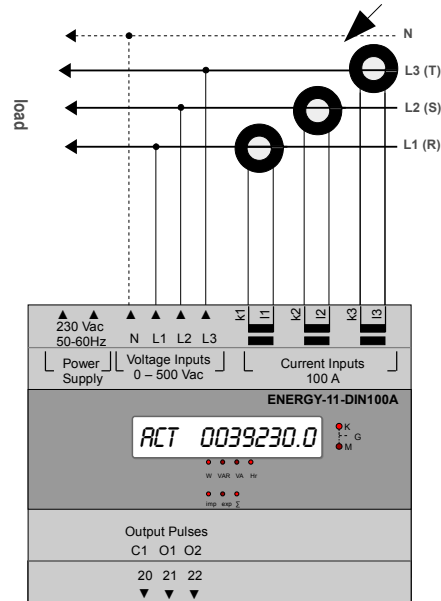
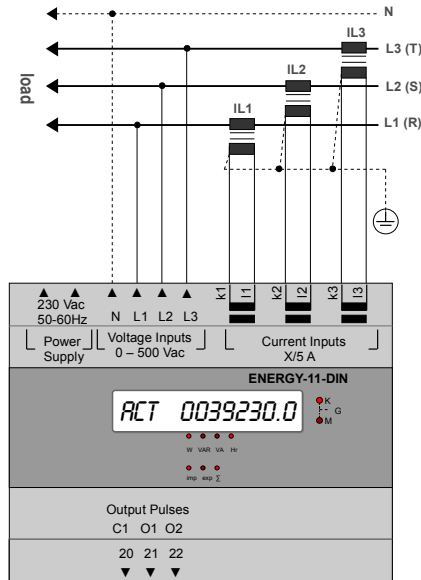
### Outputs

- Pulse Output ( 2pcs)

## ⚠ Making the Connections

- The connections of the system must be made when it is out of power.
- The connections of the device shall be connected as shown in the connection scheme.
- The current and voltage connections shall be connected in a manner that they are placed on the same phase same current transformer and with the same direction. Connection scheme must be observed.
- The value of the current transformer chosen shall not be less than the real load value and X/5 amperes. Moreover, it is recommended to chose class 0,5.
- Fuses to be used shall be FF type. Fuses to be used shall be chosen according to given current values.
- Do not supply power to the device before all the connections are checked by means of a measurement apparatus.
- The terminals for currents and voltage are suitable for cables with 2,5mm<sup>2</sup> cross- section.
- Pulse outputs terminals are suitable to max. 1,5 mm<sup>2</sup> cables

With 100A current transformers



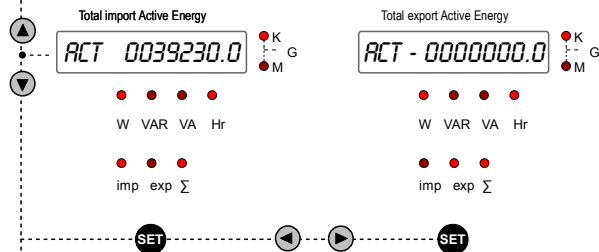
### MEASUREMENTS:

(P.F, W, VAR, VA, ΣW, ΣVAR, ΣVA, ΣWh, ΣVARh, ΣVAh)

The above parameters can be reached step by step using arrow keys. Related leds lights up and displays the corresponding parameter value which is displayed at the same time.

#### Active Energy (KWhr,MWhr,GWhr)

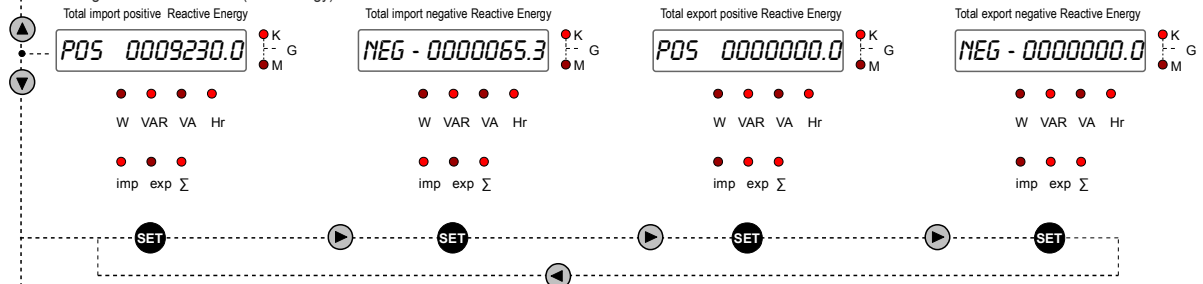
Total import and export active energy can be monitored. Energies can be deleted in (CLR Energy) menu.



#### Reactive Energy (KVARhr,MVARhr,GVARhr)

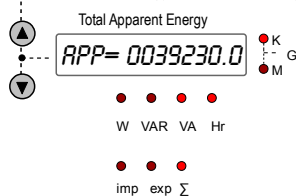
Total import/export positive and negative energy can be monitored.

Energies can be deleted in (CLR Energy) menu.

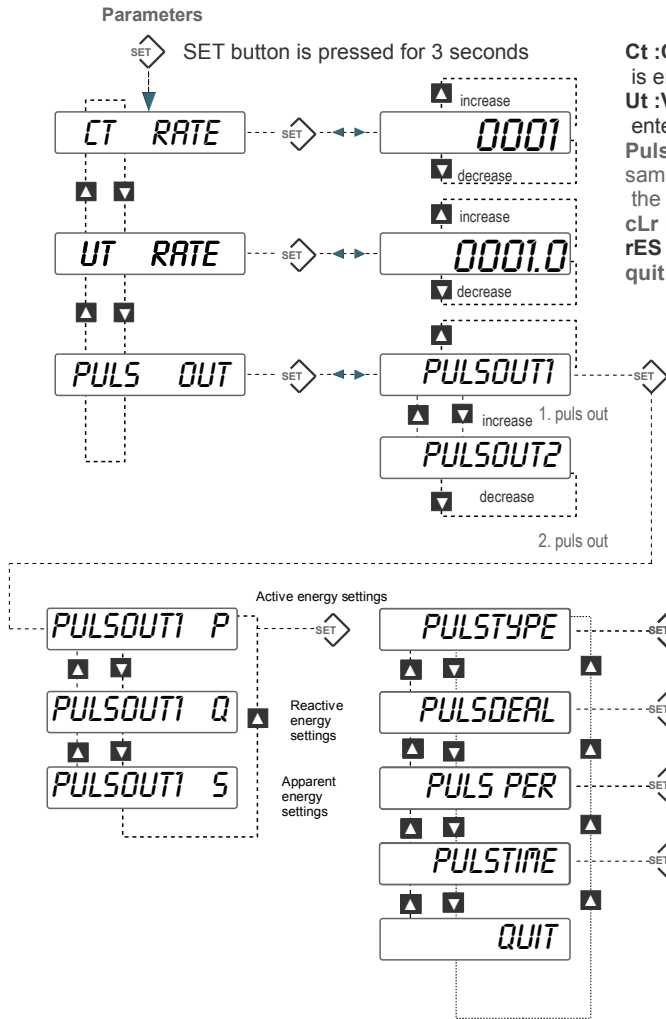


#### Apparent Energy (KVAhr)

Apparent Energy can be deleted in (CLR Energy) menu.



SET button is pressed for 3 seconds, the parameter menu can be accessed. First parameter is current transformer ratio. After pressing the SET key, value is increased or decreased by using the arrow keys. By pressing the SET button, the new value will be saved.



**Ct :Current Transformer Ratio** ( 1.....5000 ) Current transformer ratio value is entered.Example: For 500 / 5A is entered 100. (500/5A=100)  
**Ut :Voltage Transformer Ratio** ( 1.....4000 )Voltage transformer ratio value is entered.Example: For 34500 /100V is entered 345. (34500/100V=345)  
**Puls out:**The device has two digital pulse output. Menus and functions are the same for the two outputs.Outputs can be set differently according to the type of the desired energy  
**cLr** : delete  
**rES ALL PAR** : All parameters are erased and factory settings are restored  
**quit** : quit from parameter menu

**Pulse Type (PULS tyPE) :**  
 For Active Energy, it can be selected as import-export-OFF

**Pulse Type (PULS tyPE) :**  
 For Reactive Energy, it can be selected as import(ind)-import(kap)-export(ind)-export(kap)-OFF

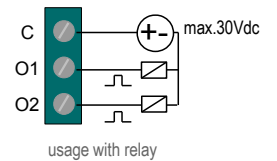
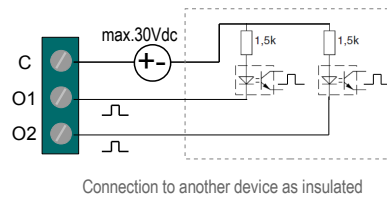
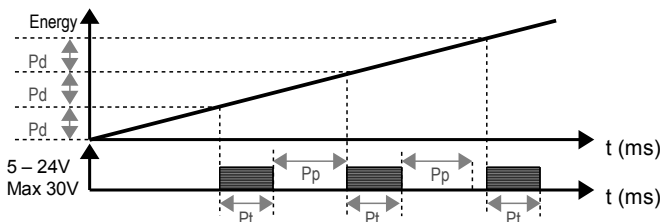
**Pd (PULS dEAL) :** 1  
 The amount of energy equivalent to Pulse. It can be selected between 0,1kWh – 10MWh

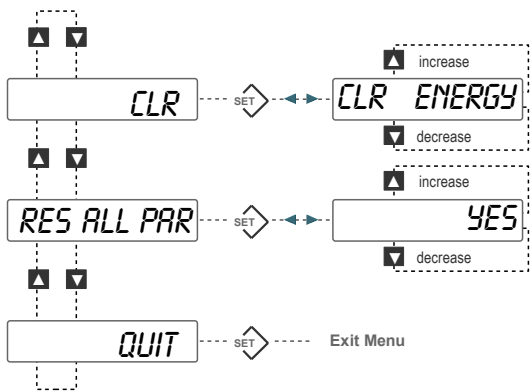
**Pp (PULS PER) :** Pulse delay time  
 It can be selected between 50ms – 900 ms

**Pt (PULS tInE) :**  
 Pulse Time It can be selected between 50ms – 900 ms

**NOTE:** If one of the three parameters P,Q,S is activated, the other two parameter will not appear in the setting menu. You can access to the other parameters menus only if they are all deactivated.

when amount of each energy (Pd) occurs , a pulse is generated from output, during time of (Pt). And then, output stays as 0V ,during time of (Pp)





CLR :Accumulated energies can be erased in this section.  
The parameters which indicated by the LEDs at the top of the device, will be erased.

rES ALL PAR : All parameters are erased and factory settings are restored

## Technical Specifications

Operating Voltage (Un)	: (Phase-Neutral) 230Vac
Operating Range	: (0,8-1,1) x Un
Operating Frequency	: 50/60 Hz
Supply Power Consumption	: < 6VA
Power Consumption of Measurement Inputs:	: < 1VA
Vin	: 1 – 300 Vac (L-N) : 2 – 600 Vac (L-L)
Iin	: (as the secondary current of the current transformer) : 0,01 - 6 Amp AC
Measurement Class	: CAT III
Voltage Transformer Ratio:	: 1 ..... 4000
Current Transformer Ratio	: 1 ..... 5000 (25000/5A)
Connection Type	: 3P&4W , 3P&3W , ARON
Demand Time	: 1 – 600 min
Display range	: 1,0V - 400,0 kV : 0,001A ..... 25000 A : 0 – 999,9 M (W,VAR,VA) : 0 – 999,9 k (W,VAR,VA) : 0 – 999.999.999 (GWh,GVARh,GVAh)
<b>accuracy</b>	
Active Power	: 1 class
Reactive Power	: 2 class
Apparent Power	: 1 class
<b>Pulse Outputs (2 pcs)</b>	
Operating Voltage	: 5 – 24Vdc max. 30Vdc
Operating Current	: max 50 mA
Min. Switching Time	: 100 ms

Device Protection Class	: IP 20
Terminal protection class	: IP 00
Ambient temperature	: - 5 °C .... + 50 °C
Installation Type	: DIN rail
Dimensions	: 105x90x59 mm

NOTE: Operating Voltage (Un): ask price and delivery time for 85-256Vac/dc

## Factory Settings

Note :When factory settings are restored, energies are set to zero.

Current Transformer(Primary) Value	: 5 / 5 A
Voltage Transformer Ratio	: 1
Pulse Type for 1.Pulse Output	: OFF
Pulse Value for 1. Pulse Output (Pd)	: 1 KWh
Pulse Duration for 1.Pulse Output (Pt)	: 100 ms
Pulse OFF Time for 1.Pulse output (Pp)	: 200 ms
Pulse Type for 2.Pulse Output	: OFF
Pulse Value for 2. Pulse Output (Pd)	: 1 KVARh
Pulse Duration for 2.Pulse Output (Pt)	: 100 ms
Pulse OFF Time for 2.Pulse output (Pp)	: 200 ms

## Formulas

Active Power	$P = \frac{1}{N} \sum_{i=0}^N P_i$
Reactive Power	$Q = \frac{1}{N} \sum_{i=0}^N Q_i$
Apparent Power	$S = \sqrt{P^2 + Q^2}$
Power Factor	$PF = \frac{P}{S}$