KLEA

220P

Energy Analyzer

POWYS

Energy Analyzer

3121-3122

User Manual

Klemsan®

İÇİNDEKİLER

Figure

Table


KLEA
220P
POWYS
3121-3122
Energy
Analyzer
SECTION 1
GENERAL
INFORMATION

SECTION 1 GENERAL INFORMATION

1.1 Device Features

Klea 220P is designed to measure;

- Phase-neutral voltages,
- Phase-phase voltages,
- Phase current,
- Neutral current,
- Frequency
- CosØ,
- Power factors,
- Active powers,
- Reactive powers,
- Apperant powers,
- THDV,
- THDI,
- 1-31 current and voltage harmonics,

Besides, Klea 220P has numerous features such as; :

- Phase loss information and sequence error display
- Determining and saving in the memory of maximum and minimum values of current, voltage, frequency, cosØ, power factor, THDV, THDI, active, reactive and apparent.
- Measuring current, active power, reactive power and apparent power values and saving in the memory
- Setting alarm for current, voltage ,frequency and power factor parameters.
- 2 tariff meters. These meters record Import Active, Export Active, Import Reactive, Export Reactive.
- Storing on hour counter (on hour), run hour counter (total energized time) and power interruption counter
- RS485 communication via MODBUS RTU protocol
- Digital inputs in order to start counter, 2nd tariff or run hour counter.
- Digital outputs which can be set to energy meters or counters as output parameters.
- 2 alarm relay outputs
- Avoiding unauthorized control by a 4-digit-password.

Table 1-1 Product Features

	KLEA 220P	KLEA 220P-B	KLEA 220P-DC (18..70 VDC)	POWYS 3121	POWYS 3122
Type of device enclosure	panel	panel	panel	Rail Mounted	Rail Mounted
Basic measurements (V,VLL, I, IN, F, Cos φ, PF, P, Q, S, THD)					
1-31 Harmonics					-
Max-Min Value					
Demand Values (I, P, Q, S)					
On hour, Run Hour, Int					
Energy Meters	2 tariffs	1 tariffs	2 tariffs	2 tariffs	2 tariffs
Assigning alarm to the parameters		-			-
Alarm Relay	2 Qty	-	2 Qty	2 Qty	-
RS485					
Digital Input	2 Qty	-	2 Qty	2 Qty	2 Qty
Digital Output	2 Qty	-	2 Qty	2 Qty	2 Qty
Indicators and leds					
Order no	606161	606163	606190	606305	606307

Please check the table above.
The product you have may not have all the features described in the User Guide.

1.2 Correct Usage and Conditions For Safety

- Installation and wiring must be performed by authorized technicians in accordance with the instructions in the user manual. Do NOTE commission the device before proper wiring.
- Make sure the device is de-energized before connecting to the mains.
- Short circuit the k-l terminals of the current transformer in another location before disconnecting the current transformers. Failing to do so will cause dangerous high voltages in the secondary terminals of the current transformers.
- Use a dry cloth to clean the device. Do NOTE use alcohol, thinner or any abrasive materials.
- Make sure all wiring is properly made before commissioning the device.
- Do NOTE open the device. There are no serviceable parts by the user.
- Keep the device away from humidity, water, vibrations and dust.
- It is advisable to connect a circuit breaker or an automatic fuse between the current input of the device and the mains (2 amps).

The manufacturer does NOTE assume any responsibility for any undesired consequences if the above measures are NOTE adhered to.

1.3 Panel Definitions

Front Panel

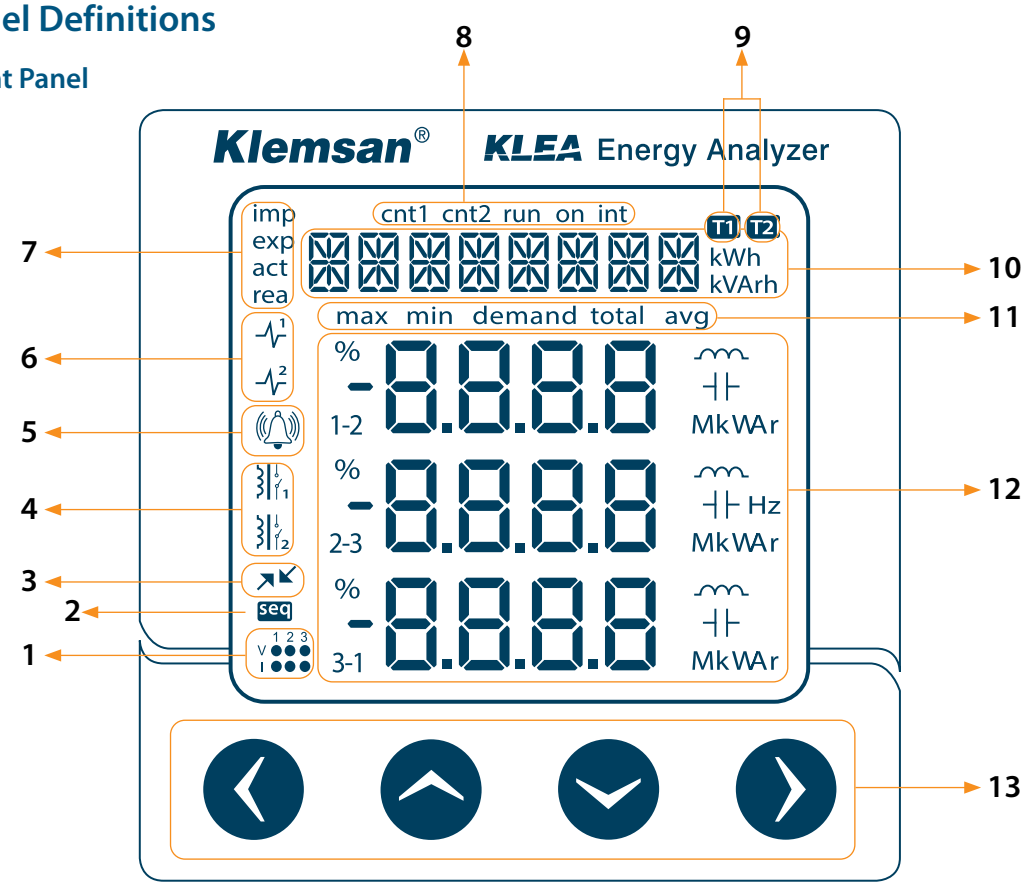


Figure 1-1 Klea 220P Front Panel

1	→	Current and Voltage situation	: Indicate phase loss of currents and voltages.
2	→	Sequence error icon	: Indicate sequence error of voltages.
3	→	Communication active icon	: Indicate that RS485 communication is made.
4	→	Relay icons	: Indicate that relays are activated.
5	→	Alarm icon	: Indicate that there is alarm on the system.
6	→	Pulse output icons	: Indicate that pulse outputs are activated.
7	→	Energy counter icons	: Indicate the type of the counter on the menu bar.
8	→	Counter icon	: Indicate the type of the counter on the menu bar.
9	→	Tariff icons	: Indicate that the counter of which tariff on the menu bar.
10	→	Menu bar and counter units	: Indicate menu names, energy counter and counters and settings.
11	→	Submenu icons	: Show that values of which submenu on the indicators.
12	→	Indicators and units	: Indicate measurements, maximum, minimum and demand values and their units.
13	→	Keys	: Use this key to switch between the menus and change the numerical values.

Back Panel

I1-k1, I2-k2, I3-k3	: Current measurement inputs
V1, V2, V3, N	: Voltage measurement inputs
D+, GND1, D	: RS 485
DI1, GND, DI2, GND	: Digital Inputs
DO1+, DO1-, DO2+, DO2-	: Digital Outputs
out1, out2	: Alarm relay outputs
Un	: Power supply

1.4 Menu Structure

The menus are shown instantaneous measurements menu and their maximum, minimum, demand, average and total value at the tables below. The menu pages change with up, down, right and left direction buttons.

1.4.1 Key Functions

The buttons placed front panel and their functions are explained at the table below.

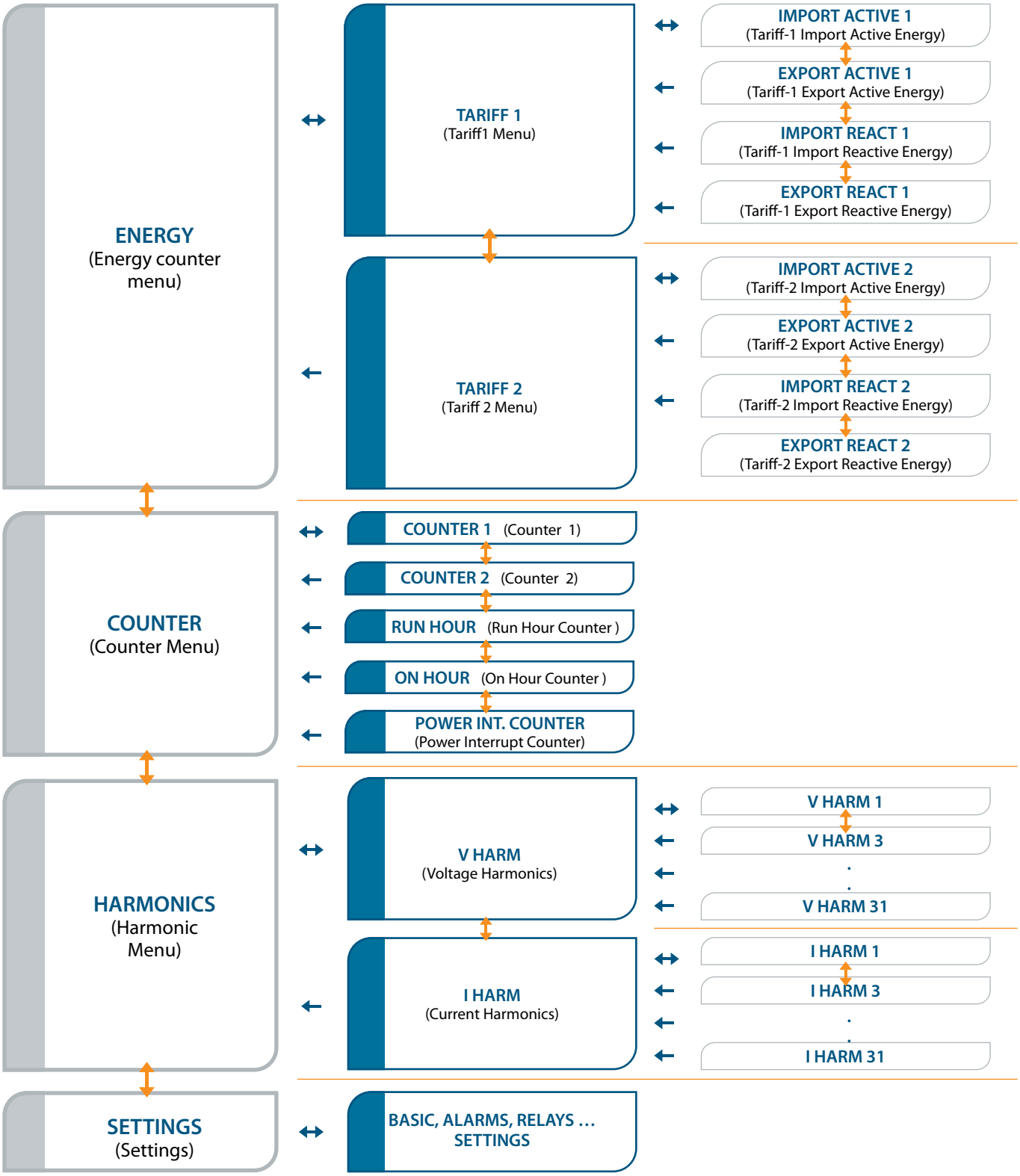
Table 1-2 Key Functions

	At the Measurements Menus		At the ENERGY, COUNTERS, HARMONICS, SETTINGS Menus		Initialize the Counter		To change the settings	
	Short Pressing (t < 2sec)	**Long Pressing (t > 2sec)**	**Short Pressing (t < 2sec)**	**Long Pressing (t > 2sec)**	**Long Pressing (t < 2sec)**	**Long Pressing (t > 2sec)**	**Short Pressing (t > 2sec)**	**Long Pressing (t > 2sec)**
RIGHT BUTTON	Switching between menus	Skips to "ENERGY" menu	Pass to the one sub-menu	Skips to bottom menu	Changes the active step	Activates the value changing	Activates the value changing or Changes the active step	N/A
DOWN BUTTON	Switching between menus	N/A	Changes the menu page	N/A	değeri değiştirir	N/A	Changes the value	N/A
UP BUTTON	Switching between menus	N/A	Changes the menu page	N/A	Changes the value	N/A	Changes the value	N/A
LEFT BUTTON	Switching between menus	Skips to Starting Page	Pass to the one upper-menu	Skip to the last menu from	Stops changing value and confirms the entering value	N/A	Stops changing value and confirms the entering value	N/A

Table 1-3 Menu Switch-1 (Instantaneous Measurement Menus and Sub Menu)

	Instantaneous Value	max.	min.	demand	avg/total	avg max/ total max	avg min/ total min	total demand
<VOLTAGE(L-N)>	VL-N	Max. VL-N	Min. VL-N		Avg. VL-N	Max. Avg. VL-N	Min. Avg. VL-N	
<VOLTAGE(L-L)>	VL-L	Max. VL-L	Min. VL-L		Avg. VL-L	Max. Avg. VL-L	Min. Avg. VL-L	
<CURRENT>	I	Max. I	Min. I	Demand I	Total I	Max Total I	Min. Total I	Total Demand I
<I NEUTR> NEUTRAL CURRENT (IN)	IN	Max. IN	Min. IN					
<COSQ> COS Ø	COS Ø	Max. COS Ø	Min. COS Ø					
<PF> POWER FACTOR (PF)	PF	Max. PF	Min. PF		Total PF	Max. Total PF	Min. Total PF	
<POWER P> ACTIVE POWER (P)	P	Max. P	Min. P	Demand P	Total P	Max Total P	Min. Total P	Total Demand P
<POWER Q> REACTIVE POWER(Q)	Q	Maks. Q	Min. Q	Demand Q	Total Q	Max. Total Q	Min. Total Q	Total Demand Q
<POWER S> APPERANT POWER (S)	S	Max. S	Min. S	Demand S	Total S	Max. Total S	Min. Total S	Total Demand S
<Σ P-Q-S> TOTAL POWER (Σ P-Q-S)	Σ P-Q-S	Max. Σ P-Q-S	Min. Σ P-Q-S	Demand Σ P-Q-S				
<FREQ> FREQUENCY(F)	F	Max. F	Min. F					
<THD V>	THDV	Max. THDV	Min. THDV					
<THD I>	Anlık	Max. THDI	Min. THDI					

Table 1-4 Menu Switch-2 (Energy, Counters,Harmonics and Setting Sub-menus)



Energy counters, counters, odd harmonics up to 31st and settings menus are placed at the table above. Menu switching are made via up, down, right and left direction buttons as stated at the table.

NOTE: Right button shall be pressed long in order to switch from Table 1-3 to Table 1-4.

1.5 Four Quadrant Representation

The angle(Ø) between voltage and current provides us information about the direction of energy flow. A positive sign for active/reactive power indicates that active/reactive power is consumed. And also a negative sign for active/reactive power indicates that active/reactive power is generated.

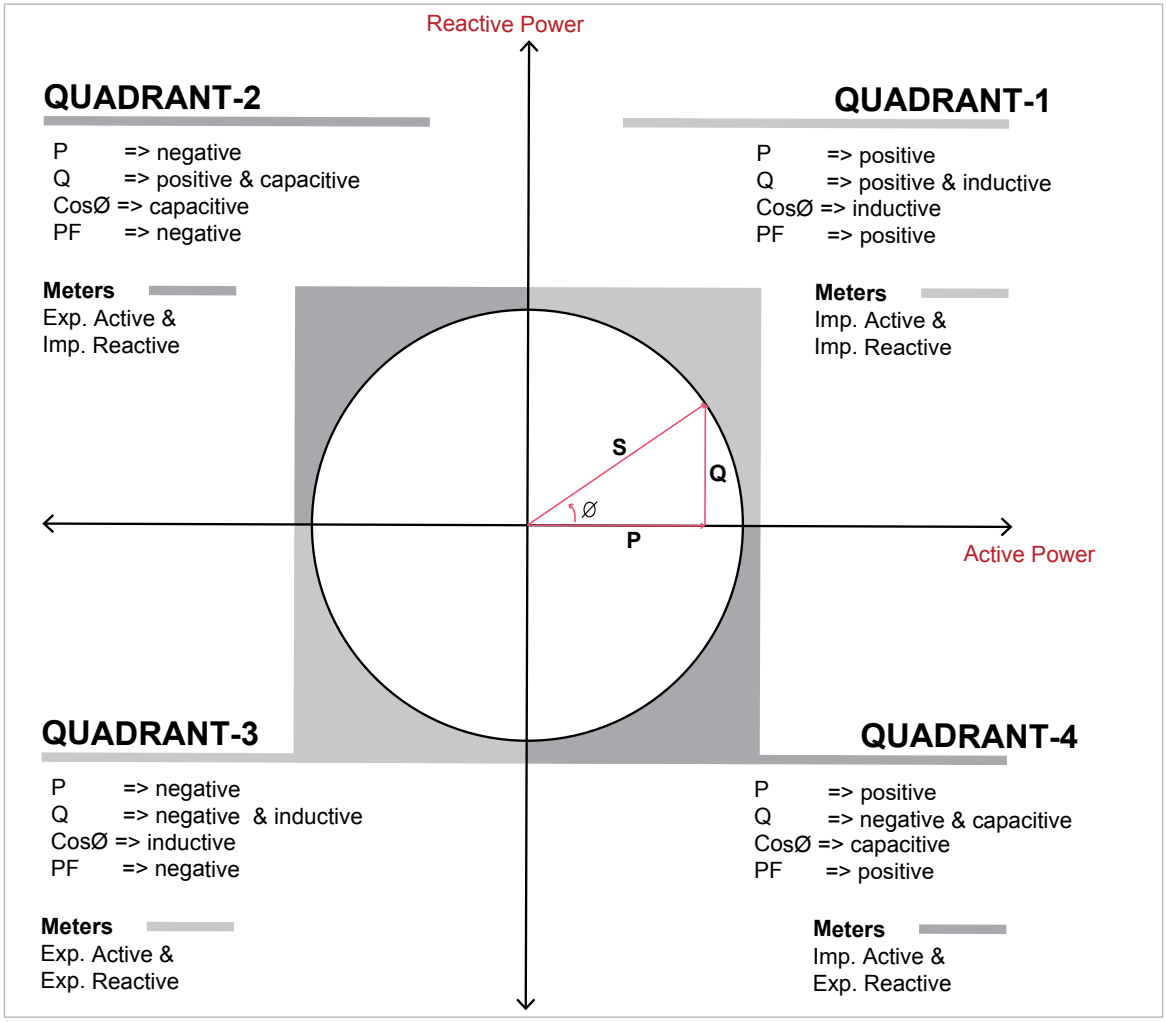


Figure 1-2 Four Quadrant Representation

NOTE: If the signs of active and reactive power are examined, it can be defined the quadrant that Klea measures.

E.g.;
P= +10kW, Q= +5kVAr => Quadrant-1
P= -10kW, Q= +5kVAr => Quadrant-2
P= -10kW, Q= -5kVAr => Quadrant-3
P= +10kW, Q= -5kVAr => Quadrant-4

KLEA
220P
POWYS
3121-3122
Energy
Analyzer

SECTION 2
INSTALLATION

SECTION 2 INSTALLATION

2.1 Preparing for Installation

Assembly and related connections of the product, must be implemented by authorized persons in accordance with the instructions of user manual.

The device must not be put into service if the operator is not sure that all connections are correctly accomplished.

2.2 Mounting

KLEA is placed vertically into the gap located in the panel. After the product is placed into the panel, fixing brackets should be installed on the product. After that it should be fixed to the panel wall with the screws.

Before wiring up voltage and current ends to KLEA, you must be sure that the power is cut.

The product is connected to current transformer(s). Before disconnecting current transformer leads, be sure that they are short circuited elsewhere or connected to a parallel load which has sufficiently low impedance. Otherwise dangerously high voltages will be induced at the current transformer leads. Same phenomena also apply for putting into service.

2.3 Connection Diagrams

2.3.1 3P-4W and 3p-3W Connections

There are two ways for connections of voltage and current. With neutral (3P-4W), without neutral (3P-3W).

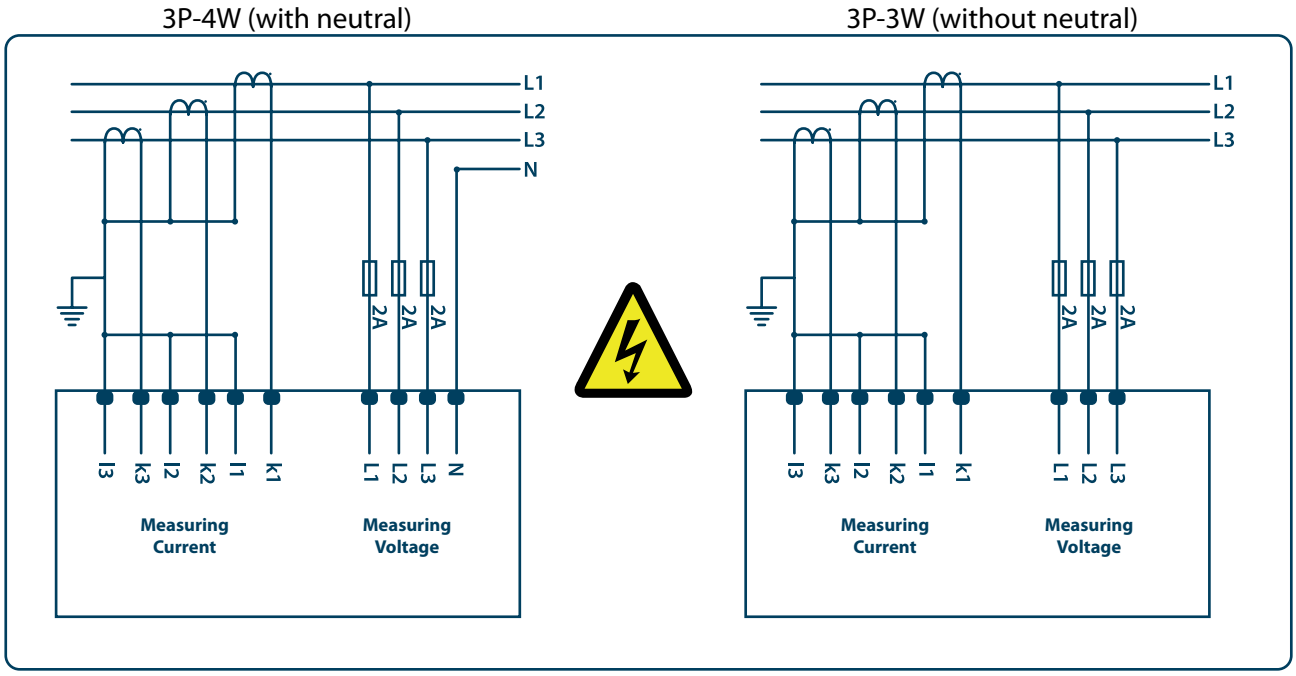


Figure 2-1 Connection Diagram

Figure 1-1 1st item, displays current and voltage phase position are On/Off. If a current or voltage phase seems incomplete and should be checked by the relevant links / connections reached the device.

Figure 1-1 2nd item, if there is an error in the voltage phase during due to incorrect sequence; "Voltage phase sequence error icon" will appear. If this icon appears; phase-sequence voltage should be checked.

2.3.2 Digital Output Connection Diagram

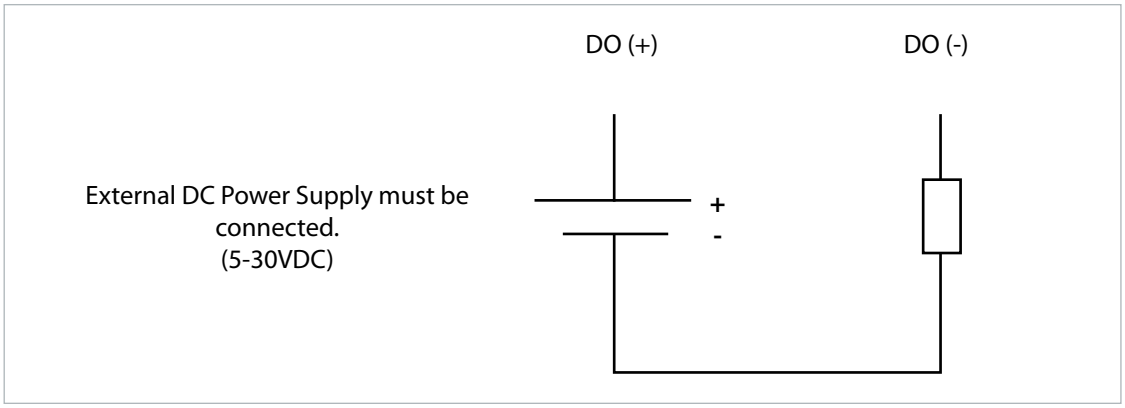


Figure 2-2 Digital Output Connection Diagram

2.4 Dimensions KLEA 220P / KLEA 220P-DC and POWYS 3121-3122 (mm)

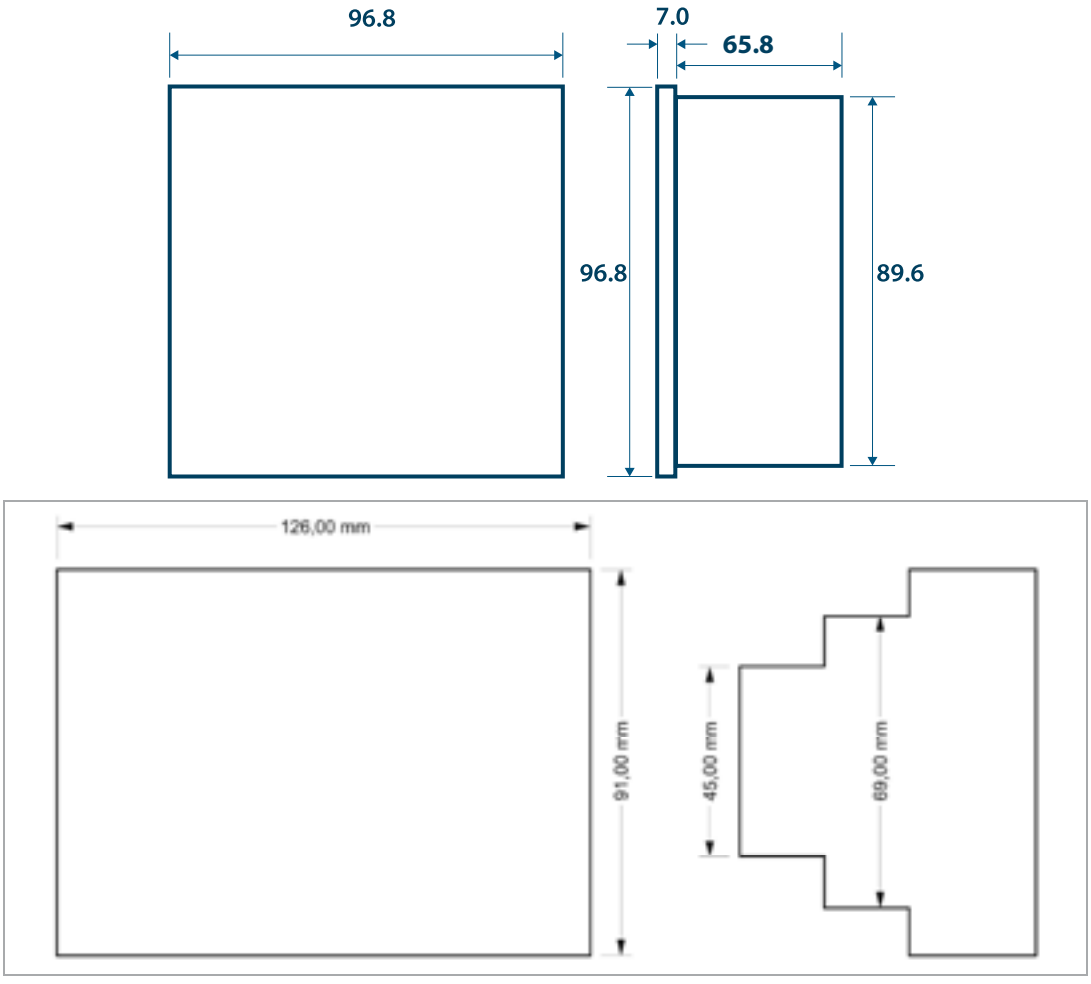
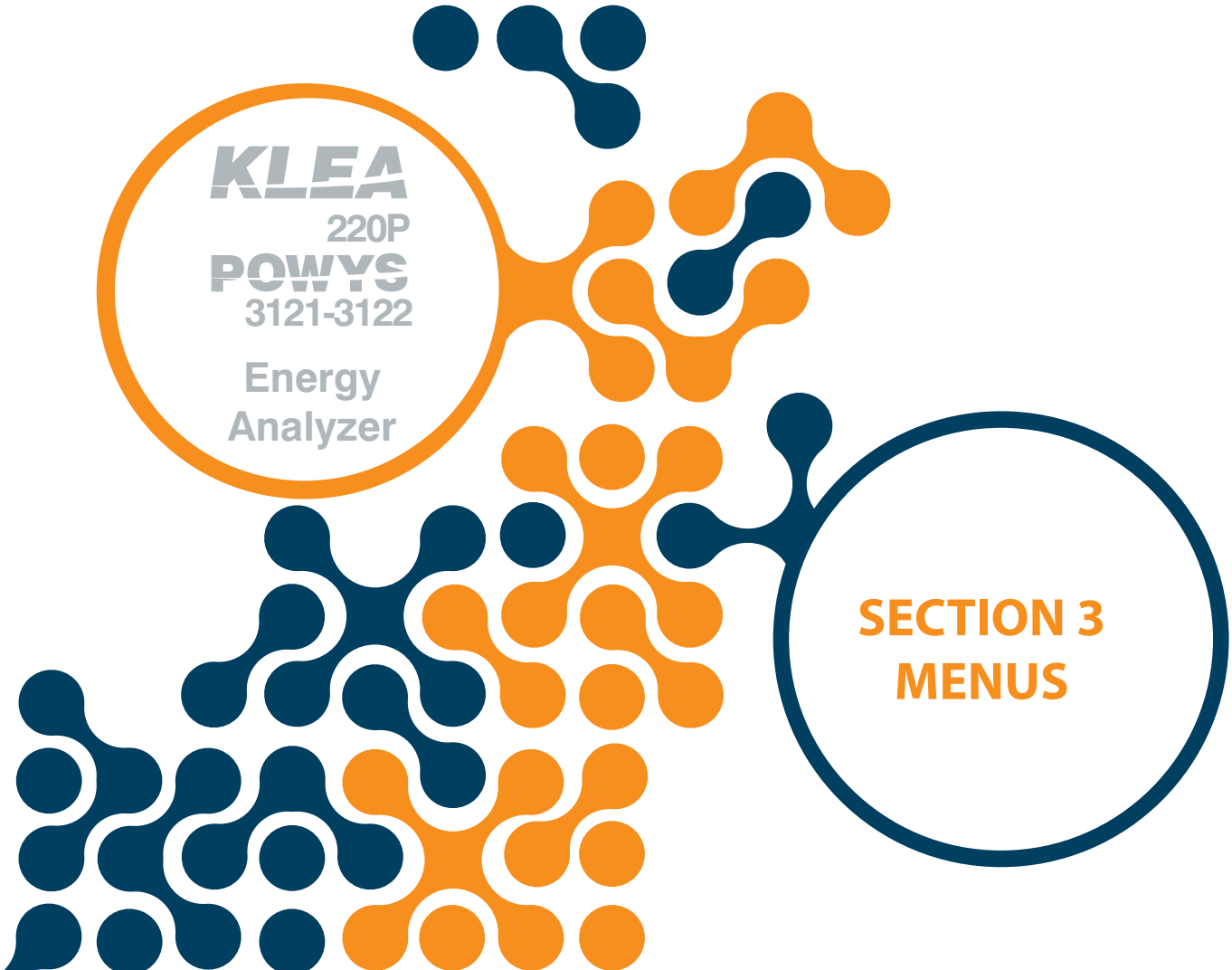


Figure 2-3 Dimensions for KLEA 220P / KLEA 220P-DC and POWYS 3121-3122


KLEA
220P
POWYS
3121-3122
Energy
Analyzer
SECTION 3
MENUS

SECTION 3 MENUS

3.1 Instantaneous Measurement Menus

Voltage (L-N and L-L), current, neutral current, cosØ, power factor, active power, reactive power, apparent power, THDV and THDI values are shown in instantaneous menu.

Menu are given the name of which is shown in Menu bar.

The values shown on the display is expressed in what phase or phases at the lower left corner of the display numbers.

Phase Numbers are not displayed at Menus which display avarege, total and other properties of network. In this case phases are displayed in 2. Level.

Next to each index value unit of respective rows are indicated. It also states that inductive or capacitive phases are indicated next to the relevant indicators.

Table 1-3 for parameters displayed in the menus.

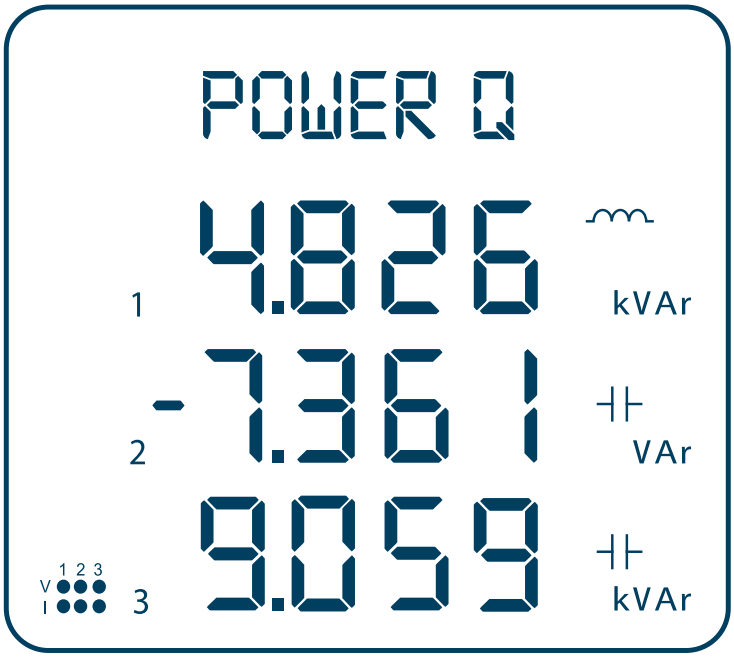


Figure 3-1 Instantaneous Measurement Menus (Reactive Power)

When the product is mounted on a panel which consumes power, active power

(P) must be positive. If active power is negative, operator should cross connect k-l leads of the current transformer.

When the product is mounted on a panel which generates power, active power (P) must be negative. If active power is positive, operator should cross connect k-l leads of the current transformer.

3.2 Maximum, Minimum ve Demand Menus

Minimum and maximum values are calculated and stored in the non-volatile memory for below parameters.

- Voltage (phase-neutral, phase-phase)
- Neutral current
- Frequency
- CosØ
- Power factor
- THDV
- THDI

Besides maximum and minimum values, demand values are calculated and stored in the non-volatile memory for below parameters.

- Current
- Active power
- Reactive power
- Apparent power

Table 1-3 shows the menu movements.

NOTE: The values held in memory can be deleted by selecting " CLEAR" menu in the "SETTINGS" menu. Reset and return to the factory settings can be made with RS 485 communication

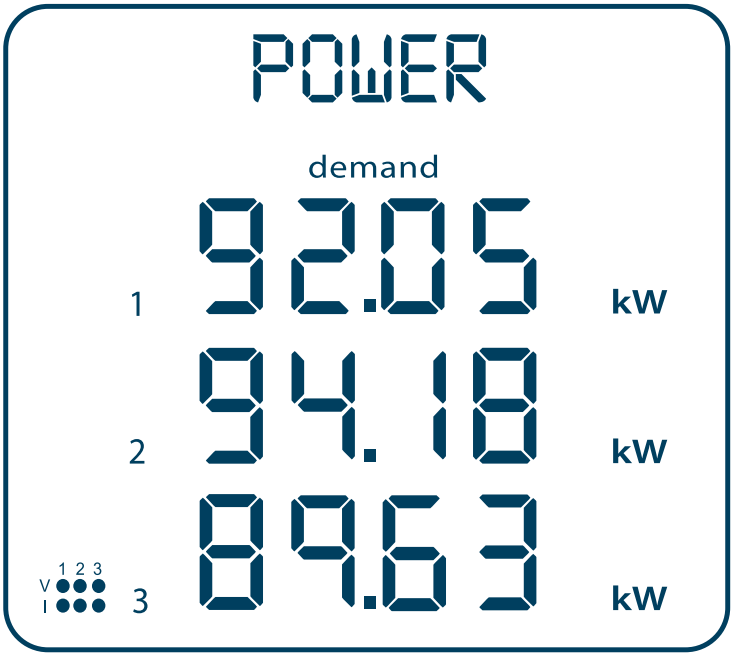
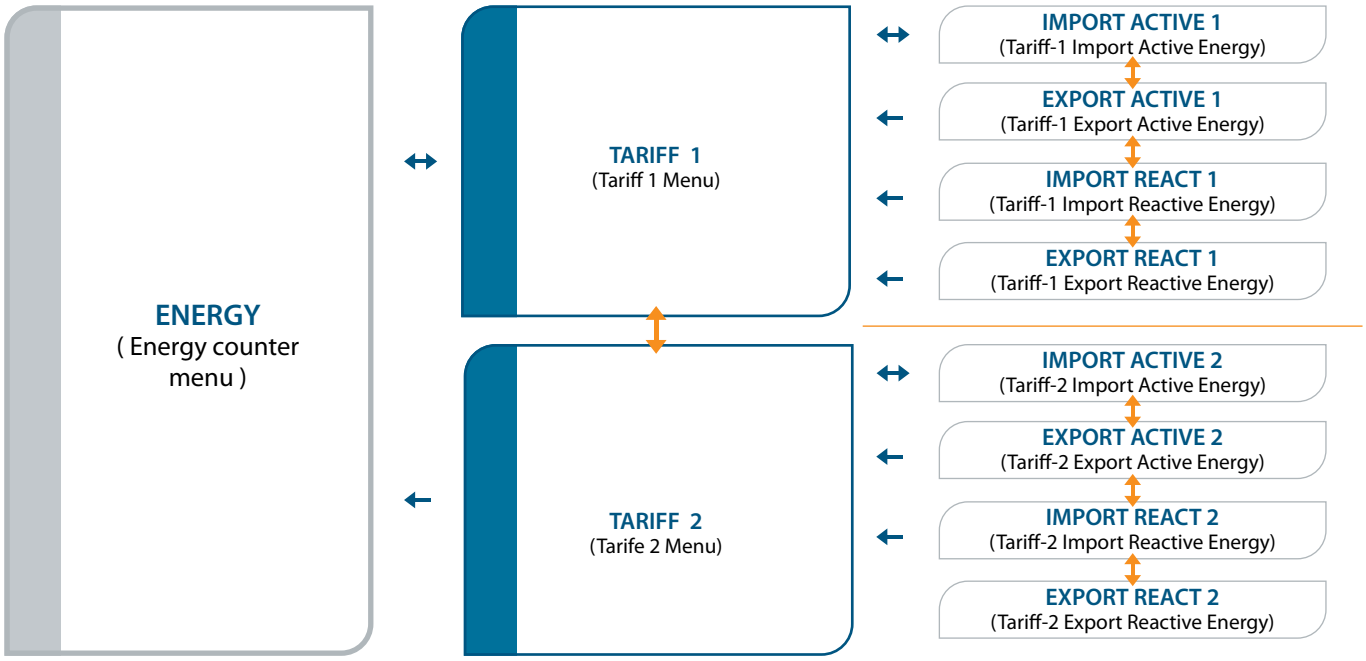


Figure 3-2 . Instantaneous Measurement Menus (Active Power)

3.3 Energy Meters Menu (ENERGY)

Counters are displayed in the format xx xxx xxx or xx xxx x.xx kWh / kVArh. For POWYS 3122, shown in only xx xxx xx.x kWh / kVArh format. When all digits of counters are reached 9 and then start over from zero. It is possible to initialize the counters under the "ENERGY" menu. Format changes are explained under 3.5.7 Pulse Output Setting Menu

Table 3-1 Energy Meters Menu



The following menu icons are active in "ENERGY" menu:

T1 : This icon appears with Tariff 1 counters
T2 : This icon appears with Tariff 2 counters
imp : This icon appears with import energy counters
exp : This icon appears with export energy counters
act : This icon appears with active energy counters
rea : This icon appears with reactive energy counters

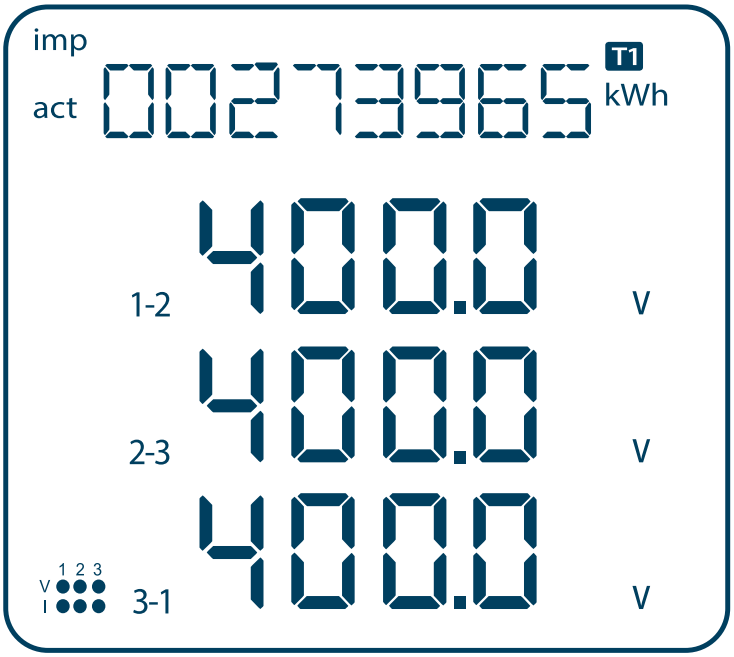


Figure 3-3 Tariff 1 Import Active Energy Menu

Counters are displayed in the format xx xxx xxx or xx xxx x.xx kWh / kVArh. For POWYS 3122, shown in only xx xxx xx.x kWh / kVArh format. When all digits of counters are reached 9 and then start over from zero. It is possible to initialize the counters under the “ENERGY” menu. Format changes are explained under (3.5.7 Pulse Output Setting Menu)

To activate 2.tarif counters, firstly digital counter input type should be selected as 2.tarif ("tr2") and it must take an active position of the digital input. DI digital input becomes active when GND- ends are shorted. Otherwise 1.tarif is active.

Figure 3-4 Tariff 2 Export Reactive Energy Menu

3.3.1 Assigning Predefined Value for Energy Meters

In any meter menu, press and hold the right key for at least 2 seconds and the respective menu title starts blinking. Using the right arrow key, move to the digit you want to change and enter the value using the up/down arrows. When you are done entering the value, confirm using the left arrow key. Move on to the storage procedure to store the changes you made. (See: 3.6.2 Save Procedure)

If password protection is enabled, press and hold the right key for at least 2 sec to display the password authentication page. Enter the password to proceed to the counter assignment.

3.4 Counters Menu (COUNTERS)

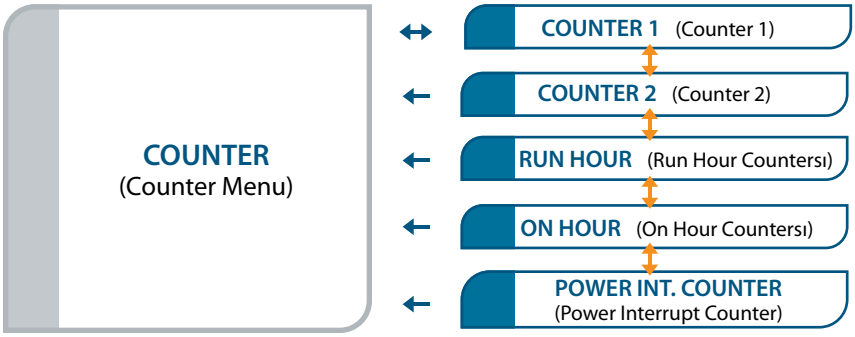
There are counters under the "COUNTERS" menu below.

- "COUNTER1": When a digital input 1 is assigned to a counter, it counts the changes in the digital input. The value is displayed in "COUNTER1" menu.
- "COUNTER2": When a digital input 2 is assigned to a counter, it counts the changes in the digital input. The value is displayed in "COUNTER2" menu.
- "ON HOUR" Counts and displays the total "on" time for the device in hours.
- "RUN HOUR": If the digital input type was set to "run hour enable", it counts the time elapsed during the digital input is in active position. This counter requires signal from 3- phase voltage and 3-phase current inputs to function without connecting to a digital input. The measured value is displayed in hours.
- "POWER INTERRUPTION COUNTER": Counts the power interruptions for the device.

"POWER INTERRUPTION COUNTER": Counts the power interruptions for the device.

The menu structure is shown below:

Table 3-2 Counters Menu Structure



Counters showing the following icons on the "COUNTERS"menu is active:

cnt1 : This icon appears with"COUNTER1" counter.

cnt2 : This icon appears with"COUNTER2" counter.

run : This icon appears with"RUN HOUR" counter.

on : This icon appears with"ON HOUR" counter.

int : This icon appears with"POWER INTERRUPTION COUNTER" counter.

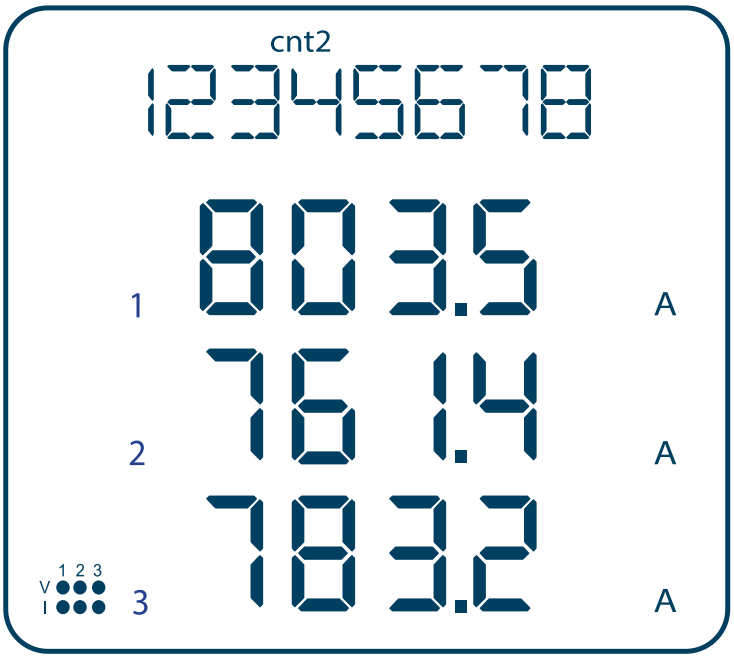


Figure 3-5 COUNTER2 Menu

Counters are displayed as 8 digits. All counters are reset at 99 999 999 and then start over from zero.

Only "COUNTER1", "COUNTER2" and "RUN HOUR" counters can be assigned values or reset. Use the procedure for assigning default values to assign values to counters.

See: 3.3.1 Save Procedure

When the energy meters are displayed instantaneously, last measured parameters (such as voltage, current, active power values etc.) are continued to display under the energy meter value as well.

3.5 Settings Menu (SETTINGS)

Klea setings are made in the SETTINGS menu. Table 3-3 shows the SETTINGS menu tree.

Table 3-3 SETTINGS Menu

Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4	Description
SETTINGS					Settings
	BASIC				Basic settings
		Ctr			Current transformer rate
		Utr			Voltage transformer rate
		Conn			Connection type options
			3P4W		3P4W connection type
			3P3W		3P3W connection type
	ALARMS				Alarm setup
		VLN ALM			Voltage (phase-neutral) alarm setup
			HI		Voltage (phase-neutral) alarm high limit
			LO		Voltage (phase-neutral) alarm low limit
			hYSt		Voltage (phase-neutral) alarm hysteresis value
			dlY.t		Voltage (phase-neutral) alarm delay time
		VLL ALM			Voltage (phase-phase) alarm setup
			HI		Voltage (phase-phase) alarm high limit
			LO		Voltage (phase-phase) alarm high low limit
			hYSt		Voltage (phase-phase) alarm hysteresis value
			dlY.t		Voltage (phase-phase) alarm delay time
		I ALM			Current alarm setup
			HI		Current alarm high limit
			LO		Current alarm low limit
			hYSt		Current alarm hysteresis value
			dlY.t		Current alarm delay time

Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4	Description
SETTINGS	ALARMS	IN ALM			Neutral current alarm setup
			HI		Neutral current alarm high limit
			LO		Neutral current alarm low limit
			hYSt		Neutral current hysteresis value
			dlY.t		Neutral current alarm delay time
		COSQ ALM			Cos φ alarm setup
			HI		Cos φ alarm high limit
			LO		Cos φ alarm low limit
			hYSt		Cos φ alarm hysteresis value
			dlY.t		Cos φ alarm delay time
		PF ALM			Power factor alarm setup
			HI		Power factor alarm high limit
			LO		Power factor alarm low limit
			hYSt		Power factor alarm hysteresis value
			dlY.t		Power factor alarm delay time
		FREQ ALM			Frequency alarm setup
			HI		Frequency alarm high limit
			LO		Frequency alarm low limit
			hYSt		Frequency alarm hysteresis value
			dlY.t		Frequency alarm delay time
	RELAYS				Relay output setup
		rLY1			Relay 1 setup
			OFF		Relay 1 OFF
			LOW		Assign relay 1 to level low alarms
			HIGH		Assign relay 1 to level high alarms
		rLY2			Relay 2 setup
			OFF		Relay 2 OFF
			LOW		Assign relay 2 to level low alarms
			HIGH		Assign relay 2 to level high alarms
	DEMAND				Demand setup
		dEd.t			Demand time setup
	RS485				RS485 setup
		bAud			Baud rate options
		Id			Slave ID setup
		PrYt			Parity check setup
			NONE		Parity check off
			EVEN		Even parity
			ODD		Odd parity

Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4	Description
SETTINGS	DI INPUT				Digital input setup
		INPUT1			Digital input 1 setup
			tYPE		Digital input 1 options
				OFF	Off
				TARIFF 2	Enable tariff 2
				COUNTER	Enable counter
				RUN HOUR	Enable Run Hour
			dLY		Digital input 1 detection delay time
			EdgE		Digital input 1 detection edge
				RISING	Detection in rising edge
				FALLING	Detection in falling edge (Only valid for counter)
				BOTH EDG	Detection in both edges (Only valid for counter)
		INPUT2			Digital input 2 setup
			tYPE		Digital input 2 options
				OFF	Off
				TARIFF 2	Enable tariff 2
				COUNTER	Enable counter
				RUN HOUR	Enable Run Hour
			dLY		Digital input 2 detection delay time
			EdgE		Digital input 2 detection edge
				RISING	Detection in rising edge
				FALLING	Detection in falling edge (Only valid for counter)
				BOTH EDG	Detection in both edges (Only valid for counter)
	PULSE				Pulse output setup
		OUT1			Pulse output 1 setup
			OUT		Pulse output 1 parameter setup
				OFF	Off
				IMP ACT1	Assign to tariff 1 import active energy counter
				EXP ACT1	Assign to tariff 1 export active energy counter
				IMP REA1	Assign to tariff 1 import reactive energy counter
				EXP REA1	Assign to tariff 1 export reactive energy counter
				IMP ACT2	Assign to tariff 2 import active energy counter
				EXP ACT2	Assign to tariff 2 export active energy counter
				IMP REA2	Assign to tariff 2 import reactive energy counter
				EXP REA2	Assign to tariff 2 export reactive energy counter

Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4	Description
SETTINGS	PULSE	OUT1	OUT	DIN1	Assign to digital input 1 counter
				DIN2	Assign to digital input 2 counter
			durA		Pulse duration of the pulse output 1
			rAt		Step range for pulse output 1
		OUT2			Pulse duration of the pulse output 2
			OUT		Step range for pulse output 2
				OFF	Off
				IMP ACT1	Assign to tariff 1 import active energy counter
				EXP ACT1	Assign to tariff 1 export active energy counter
				IMP REA1	Assign to tariff 1 import reactive energy counter
				EXP REA1	Assign to tariff 1 export reactive energy counter
				IMP ACT2	Assign to tariff 2 import active energy counter
				EXP ACT2	Assign to tariff 2 export active energy counter
				IMP REA2	Assign to tariff 2 import reactive energy counter
				EXP REA2	Assign to tariff 2 export reactive energy counter
				DIN1	Assign to digital input 1 counter
				DIN2	Assign to digital input 2 counter
			durA		Pulse duration of the pulse output 2
			rAt		Step range for pulse output 2
	SECURITY				Password protection setup
		Act			Enable/disable password protection
			NO		password protection disable
			YES		password protection enable
		Pin.t			Timeout for password protection. If you do press any keys after entering the password or do not change any settings via MODBUS, password protection is re-enabled after the time has elapsed.
		Pin			Password value
	DISPLAY				Secreen setup
		MENU			Menu setup
			ScrL		Menu scroll setup
				OFF	Menu scroll disable
				ON	Menu scroll enable
			Scr.P		Menu display time
			Strt		Home page setup
				VOLTAGELN	Home page Voltage(L-N)
				VOLTAGELL	Home page Voltage(L-L)
				CURRENT	Home page Current

Menu	Sub Menu 1	Sub Menu 2	Sub Menu 3	Sub Menu 4	Description
SETTINGS	DISPLAY	MENU	Strt	I NEUTR	Home page Neutral Current
				COSQ	Home page CosQ
				PF	Home page Power Factor
				POWER P	Home page Active Power
				POWER Q	Home page Reactive Power
				POWER S	Home page Apperant Power
				Σ P-Q-S	Home page Total Power
				FREQ	Home page Frequency
				THD V	Home page THDV
				THD I	Home page THDI
				ENERGY	Homepage Energy
		BACKLGHT			Display backlight setup
			oPt		Display backlight options
				TIME DEP	Display backlight depending on the time
				CONT ON	Display backlight always on
				CONT OFF	Display backlight always off
			durA		Display backlight always on time
	CLEAR				Clear Menu
		CLr			
			OFF		Clear abort
			ALL		Reset the device to factory settings
			ENERGY		Clear the energy counters
			COUNTERS		Clear the counters
			MAX VALS		Clear the max. values
			MIN VALS		Clear the min. values
			DEMANDS		Clear the demand values
			SETTINGS		Reset the setup to factory settings
			ALARMS		Reset the alarm setup to factory settings
	INFO				Information
		UEr			Firmware version information

3.5.1 Basic Settings Menu (BASIC)

This is the menu item where you make the current transformer ratio, voltage transformer ratio and connection type settings. Please see Table 3-3 for the menu tree and SECTION 5 for the menu tree and Section 5 for the factory default settings.

Current transformer ratio (Ctr): The calculated currents are multiplied by the current transformer ratio (Ctr) to be indicated on the displays and the modbus addresses.

Voltage transformer ratio (Utr): The calculated voltages are multiplied by the voltage transformer ratio (Utr) to be indicated on the displays and the modbus addresses.

Connection (Conn): This menu is for the network connection settings.

If "3P4W" (3-phase, 4-wire connection type) was specified for the network connection setup, the initial menu is "Voltage (Phase-Neutral)". This menu is displayed first when the device is energized.

If "3P3W" (3-phase, 3-wire connection type) was specified for the network connection setup, the initial menu is "Voltage (Phase-Phase)". This menu is displayed first when the device is energized.

3.5.2 Alarm Settings Menu (ALARMS)

Use this menu item to set the alarm limits, hysteresis value and alarm delay time. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

Outside the alarm limits:

- The values which are belong to adjusted alarm parameter, start flashing.
- When alarm delay time is expired, (🔔) symbol is displayed in main scren.
- If relay outputs are assigned to any alarm and also if there is an alarm in the system, related relay symbols (I_1, I_2) are displayed in the main screen after alarm delay time.

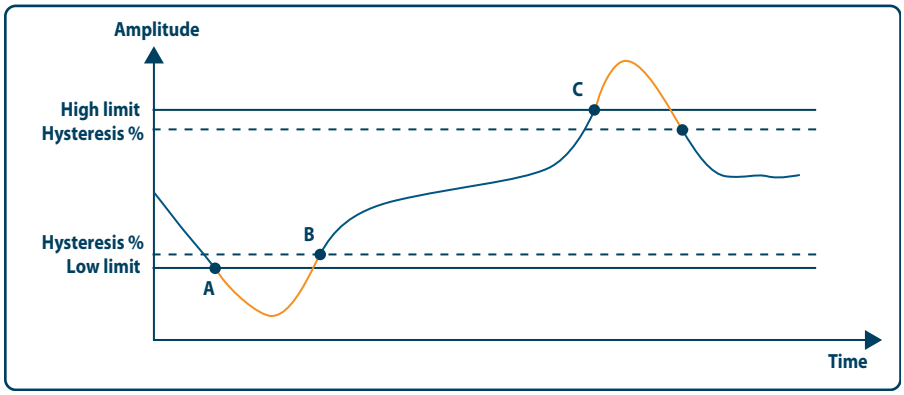


Figure 3-6 Alarm Example

- A low limit alarm occurs at point A.
- Alarm disappears at point B.
- A high limit alarm occurs at point C.
- Alarm disappears at point D.

3.5.3 Alarm Relay Settings Menu (RELAYS)

Use this menu item to set the conditions of the alarm relays. You can set both alarm relays to the following positions:

- OFF : Relay does not energize in an alarm condition.
- LO : Relay energizes when a low limit alarm occurs.
- HI : Relay energizes when a high limit alarm occurs.

Related relay is de-energized when the alarm condition ends. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings

3.5.4 Demand Period Setting Menu (DEMAND)

Use this menu item to setup the demand period. At the end of the specified period, demand values are calculated in a periodic cycle.

Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

3.5.5 RS485 Settings Menu (RS485)

Use this menu item to set the baudrate, slave ID and parity control settings in RS485 communication. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

Baudrate (bAud): Communication Signal speed is expressed with "baud" in terms of units. The baud rate can be changed in the adjustment range.

Slave ID (Id): RS485 communication is working on the basis of one or more slave devices communicate with one master. KLEA, as a slave in the RS485 communication responds to queries made by the master. If the device is slave match in this communication are set in the slave ID Menu.

Parity Check (PrtY): It is a control mechanism for data accuracy. It counts odds ''1'' in Binary data. There are ''odd''and 'even'' parity control method.
For communication, master and slave devices must be using the same method.
The desired method is selected from the menu or " NONE" option selected to make parity check feature turned off.

3.5.6 Digital Input Settings Menu (DI INPUT)

Use this menu item to set the on/off position, type, delay time and detection edge for the digital input. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

Digital input is based on dry contact detection principle. Never apply signal to inputs. Otherwise there is risk of damaging the device.

Digital input type (tYPE):

● Option to enable tariff 2 (TARIFF 2): If you choose this option for the digital input type, tariff2 energy counters will be enabled when the digital input is active (dry contact must be applied from related DIN+ and DIN-).

● Option to enable the counter (COUNTER): If you choose this option for the digital input type, the counter will count the changes in the position of the digital input depending on the chosen detection edge.

❍ If you choose rising edge detection (RISING) for the detection edge, the counter will increase by 1 on each activation of the dry contact that is connected to the digital input.

❍ If you choose falling edge detection (FALLING) for the detection edge, the counter will increase by 1 on each de-activation of the dry contact that is connected to the digital input.

❍ If you choose both edges detection (BOTH EDGE) for the detection edge, the counter will increase by 1 on each activation and de-activaton of the dry contact that is connected to the digital input.

● Run Hour enable option (RUN HOUR): If you choose this option for the digital input type, the "run hour counter" start counting when the digital input is active.(Dry contact must be applied from related DIN+ and DIN-).

Detection delay time (dLY):

The input is enabled or disabled based on the detection delay time which is set to account for contact spikes or noise in the digital input.

Detection edge (EdgE):

Use this menu item to choose the position where the digital input is detected active or passive. This menu is available only for the digital input mode "counter". Other options always use the rising edge detection.

3.5.7 Pulse Output Settings Menu (PULSE)

This menu is used to set on / off position, output parameters, pulse duration and step range for the pulse outputs. Output parameters can be adjusted according to energy values and digital input. Settings for both pulse outputs can be made seperately. See Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

Pulse outputs become active whenever the adjusted output parameter is increased by each step range and remain in this position for a set time and then deactive.

Output parameter setup (OUT):

It is the menu that used to set the output depending on which parameter. If "OFF" option is selected, related outputs are closed.

NOTE:

CT – VT ratios are included in the index calculations and energy values are in kWh and kVArh unit by default. These values can be changed via the Monalyzer or the addresses specified in the Modbus register table. In case of a change, new settings become active after the "save changes" command is sent.

• If "0" is written in 900th Modbus address, CT - VT ratios are included in index calculations and outputs give pulses in kWh and kVArh units.

• Due to "1" is written in 900th Modbus address, CT - VT ratios will not be included in the index calculations and outputs gice pulses in Wh and VArh units.

In POWYS 3122, it can only be output according to kWh / kVArh unit.

Pulse duration setup (durA):

It is the menu where the duration of the pulse is set.

Pulse step range (rAt):

It is the menu where the smallest amount of increase of input parameter to be pulse is set.

3.5.8 Password Settings Menu (SECURITY)

Use this menu item to turn the password protection on/off, set a password activation time and change password settings editing options. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

4 digit password protects the product setup and counter menus against unauthorized access and modifications. When activated, a password query screen is displayed if someone attempts to change the values. After a successful login, the device will not ask for a password until the "password activation time" has elapsed. You can set this value in the respective menu item. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

If you do not press any keys after entering the password or do not change the settings via MODBUS, password protection is re-enabled after the password activation time has elapsed.

3.5.9 Display Setup (DISPLAY)

The settings about menu screen and backlight are made in this menu.

Menu Setup (MENU):

Menu scroll setting, display time and start page are made in this sub-menu.

- **Menu scroll setup (ScrL):** Menu Navigation is given as a name to command which

is moving menu screen to next one at the end of display time. If "ON " is selected, Menu navigation is activated after device start or 15 seconds after the last key is pressed.

● **Menu display period (Scr.P):** Each menu appears in the screen during the period that is adjusted in "menu display time". The unit is second and it is effective when menu scroll mode is "on". It is ineffective when menu scroll mode is "off".

● **Home page setup (Strt):** When the device is first energized, first screen menu is called Menu opening page. Any of this menu can be set from available instantaneous measurements Menu as Home page. Pre value "VOLTAGELN" menu is designated as Home page.

Display Backlight Setup (BACKLGHT)

Is subhead which lets adjustment of display backlight options and duration of backlight.

● **Display backlight options (oPt):** This menu is adjustment of display backlight activation depending on the time (TIME DEP), always on (CONT ON) or permanently closed (CONT OFF).

Time Dependent (TIME DEP): Backlight is turned on with device operates or with a pressing any key. Display backlight will be turned off if there is no pressing any key after set time. It is preferred to have longer-lasting power -saving and LED lighting.

❍ Continuous ON (CONT ON): Display backlight stays on permanently.

❍ Continuous OFF (CONT OFF): Display backlight is permanently closed.

❍ Display Backlight On Time (durA): Menu is where screen backlight time period is set with unit of second.

● **Display Backlight On Time (durA):** Menu is where screen backlight time period is set with unit of second.

3.5.10 Clear Menu (CLEAR)

Use this menu to delete the stored values in the memory and restore the factory settings. Please see Table 3-3 for the menu tree and SECTION 5 for the factory default settings.

The following options are available in the clear menu:

• OF : Disables the clear process.

• ALL : Clears all values stored in the memory and restores them to the default factory settings.

• ENERGY : Resets all energy counters.

• COUNTERS : Resets all counters.

• MAX VALS : Clears the maximum values stored in the memory.

• MIN VALS : Clears the minimum values stored in the memory.

• DEMAND : Clears the demand values stored in the memory.

• SETTINGS : Restores all settings to the factory settings

• ALARMS : Restores the alarm settings to the factory settings.

In order to prevent an accidental deletion, "nO" / "YES" prompt is displayed if you choose any option other than "OFF" 3.6.3 Approval Prosedure

• To confirm the action:

Press the right key to blink the "NO" sign. Use the up/down keys to change the "NO" to "YES". Then, press the left key to confirm the action.

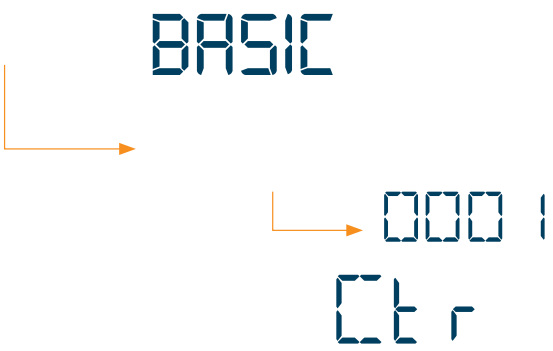
• To discard the action:

Press the right key to blink the "NO" sign. Then, press the left key to confirm the "NO" option and exit the menu without making any deletions.

The device restarts if you choose SETINGS, ALARM or All and confirm the action. It will not restart if you choose other options. It will clear the values and returns back to the CLEAR menu.

3.6 Save, Changing Value and Approval Prosedure

3.6.1 Changing Value/Setting



Menu titles in the menu "SETTINGS" are displayed in the menu bar. When the submenus are entered into, the menu in which the change will occur is shown in the indicator in the first row and the value belonging the related setting is shown in the menu bar and the change may be made here.

There are 2 different menus for changing the values:

• **Multiple choice menus:** These menus contain predefined options. Press the right key to choose and blink the first variable of the menu. Press the up/down keys to choose and blink the desired option. Then press the left button to complete your choice.

• **Menus with numerical input values:** In these menus, move through the digits to set the desired value. Press the right key to choose and blink the first digit of the variable from the left. Use the right key to move through the digits. Use the up/down keys to increase/decrease the value of the active digit. Set the desired values for variables by setting the individual digit values and press the left key to complete your action.

If any change is made on settings, a registration procedure which is questioning whether or not to record the change will be active after return to " settings" menu. If the changes are saved, device restarts. See: 3.6.2 Save Prosedure

3.6.2 Save Prosedure

Press the left key until you see the “SAUE” display to confirm or discard the changes you made.

To confirm the changes:

Press the right key to blinkthe “NO” sign. Use the up/down keys to change the “NO” to “YES”. Then, press the left key to store the changes.

Değişiklikler reddedilecekse:

Press the right key to blink the “NO” sign. Then exit the menu using the left key without saving your changes.

3.6.3 Approval Procedure

Following query screen comes up to confirm the action or to reject. To confirm the changes:

Press the right key to blink the "NO" sign. Use the up/down keys to change the "NO" to "YES". Then, press the left key to store the changes.

To discard the changes:

Press the right key to blink the "NO" sign. Then exit the menu using the left key without saving your changes.

In the Delete Menu SETTINGS ALL or ALARMS option shuts down the device after the approval of the selected transactions will be reopened. Other options for the restart process is not performed. The device returns to the CLEAR menu and perform the deletion


KLEA
220P
POWYS
3121-3122
Energy
Analyzer
SECTION 4
RS485
COMMUNICATION

SECTION 4 RS485 COMMUNICATION

4.1 Readable and Writable Data

The following functions are supported:

- **Function 03H:** This function reads the readable addresses in the modbus table.
- **Function 10H:** This function writes to the writable addresses in the modbus table.

Specifications:
- R / W : Can read and write the value in this address.
- RO : Can only read the value in this address.
- WO : Can only write to this address
- float : 32 bit floating number.

Related modbus table is given below:
NOTE: The counter readings for POWYS 3122 are calculated by dividing by 100.

Table 4-1 Readable and Writable Data

Adress	Parametre	Type	Read / Write	Write Condition
Faz 1 Basic Measurements				
0	Phase 1 Voltage (L-N)	float	RO	
2	Phase 1-2 Voltage (L-L)	float	RO	
4	Phase 1 Current	float	RO	
6	Phase 1 Cosφ	float	RO	
8	Phase 1 Power Factor	float	RO	
10	Phase 1 Active Power	float	RO	
12	Phase 1 Reactive Power	float	RO	
14	Phase 1 Apparent Power	float	RO	
16	Phase 1 THDV	float	RO	
18	Phase 1 THDI	float	RO	
Phase -2 Basic Measurements				
20	Phase 2 Voltage (L-N)	float	RO	
22	Phase 2-3 Voltage (L-L)	float	RO	
24	Phase 2 Current	float	RO	
26	Phase 2 Cosφ	float	RO	
28	Phase 2 Power Factor	float	RO	
30	Phase 2 Active Power	float	RO	
32	Phase 2 Reactive Power	float	RO	
34	Phase 2 Apparent Power	float	RO	
36	Phase 2 THDV	float	RO	
38	Phase 2 THDI	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
Phase -3 Basic Measurements				
40	Phase 3 Voltage (L-N)	float	RO	
42	Phase 3-1 Voltage (L-L)	float	RO	
44	Phase 3 Current	float	RO	
46	Phase 3 Cosφ	float	RO	
48	Phase 3 Power Factor	float	RO	
50	Phase 3 Active Power	float	RO	
52	Phase 3 Reactive Power	float	RO	
54	Phase 3 Apparent Power	float	RO	
56	Phase 3 THDV	float	RO	
58	Phase 3 THDI	float	RO	
Common Measurements (Phase-1, Phase-2, Phase-3)				
60	Average Voltage (L-N)	float	RO	
62	Average Voltage (L-L)	float	RO	
64	Total Current	float	RO	
66	System Power Factor	float	RO	
68	Total Active Power	float	RO	
70	Total Reactive Power	float	RO	
72	Total Apparent Power	float	RO	
74	System Frequency	float	RO	
76	Neutral Current	float	RO	
Phase-1 Voltage Harmonic Measurements				
78	Phase 1 Voltage Harmonics 1	float	RO	
80	Phase 1 Voltage Harmonics 3	float	RO	
82	Phase 1 Voltage Harmonics 5	float	RO	
84	Phase 1 Voltage Harmonics 7	float	RO	
86	Phase 1 Voltage Harmonics 9	float	RO	
88	Phase 1 Voltage Harmonics 11	float	RO	
90	Phase 1 Voltage Harmonics 13	float	RO	
92	Phase 1 Voltage Harmonics 15	float	RO	
94	Phase 1 Voltage Harmonics 17	float	RO	
96	Phase 1 Voltage Harmonics 19	float	RO	
98	Phase 1 Voltage Harmonics 21	float	RO	
100	Phase 1 Voltage Harmonics 23	float	RO	
102	Phase 1 Voltage Harmonics 25	float	RO	
104	Phase 1 Voltage Harmonics 27	float	RO	
106	Phase 1 Voltage Harmonics 29	float	RO	
108	Phase 1 Voltage Harmonics 31	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
Phase-1 Current Harmonic Measurements				
110	Phase 1 Current Harmonics 1	float	RO	
112	Phase 1 Current Harmonics 3	float	RO	
114	Phase 1 Current Harmonics 5	float	RO	
116	Phase 1 Current Harmonics 7	float	RO	
118	Phase 1 Current Harmonics 9	float	RO	
120	Phase 1 Current Harmonics 11	float	RO	
122	Phase 1 Current Harmonics 13	float	RO	
124	Phase 1 Current Harmonics 15	float	RO	
126	Phase 1 Current Harmonics 17	float	RO	
128	Phase 1 Current Harmonics 19	float	RO	
130	Phase 1 Current Harmonics 21	float	RO	
132	Phase 1 Current Harmonics 23	float	RO	
134	Phase 1 Current Harmonics 25	float	RO	
136	Phase 1 Current Harmonics 27	float	RO	
138	Phase 1 Current Harmonics 29	float	RO	
140	Phase 1 Current Harmonics 31	float	RO	
Phase-2 Voltage Harmonic Measurements				
142	Phase 2 Voltage Harmonics 1	float	RO	
144	Phase 2 Voltage Harmonics 3	float	RO	
146	Phase 2 Voltage Harmonics 5	float	RO	
148	Phase 2 Voltage Harmonics 7	float	RO	
150	Phase 2 Voltage Harmonics 9	float	RO	
152	Phase 2 Voltage Harmonics 11	float	RO	
154	Phase 2 Voltage Harmonics 13	float	RO	
156	Phase 2 Voltage Harmonics 15	float	RO	
158	Phase 2 Voltage Harmonics 17	float	RO	
160	Phase 2 Voltage Harmonics 19	float	RO	
162	Phase 2 Voltage Harmonics 21	float	RO	
164	Phase 2 Voltage Harmonics 23	float	RO	
166	Phase 2 Voltage Harmonics 25	float	RO	
168	Phase 2 Voltage Harmonics 27	float	RO	
170	Phase 2 Voltage Harmonics 29	float	RO	
172	Phase 2 Voltage Harmonics 31	float	RO	
Phase-2 Current Harmonic Measurements				
174	Phase 2 Current Harmonics 1	float	RO	
176	Phase 2 Current Harmonics 3	float	RO	
178	Phase 2 Current Harmonics 5	float	RO	
180	Phase 2 Current Harmonics 7	float	RO	
182	Phase 2 Current Harmonics 9	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
184	Phase 2 Current Harmonics 11	float	RO	
186	Phase 2 Current Harmonics 13	float	RO	
188	Phase 2 Current Harmonics 15	float	RO	
190	Phase 2 Current Harmonics 17	float	RO	
192	Phase 2 Current Harmonics 19	float	RO	
194	Phase 2 Current Harmonics 21	float	RO	
196	Phase 2 Current Harmonics 23	float	RO	
198	Phase 2 Current Harmonics 25	float	RO	
200	Phase 2 Current Harmonics 27	float	RO	
202	Phase 2 Current Harmonics 29	float	RO	
204	Phase 2 Current Harmonics 31	float	RO	
Phase-3 Voltage Harmonic Measurements				
206	Phase 3 Voltage Harmonics 1	float	RO	
208	Phase 3 Voltage Harmonics 3	float	RO	
210	Phase 3 Voltage Harmonics 5	float	RO	
212	Phase 3 Voltage Harmonics 7	float	RO	
214	Phase 3 Voltage Harmonics 9	float	RO	
216	Phase 3 Voltage Harmonics 11	float	RO	
218	Phase 3 Voltage Harmonics 13	float	RO	
220	Phase 3 Voltage Harmonics 15	float	RO	
222	Phase 3 Voltage Harmonics 17	float	RO	
224	Phase 3 Voltage Harmonics 19	float	RO	
226	Phase 3 Voltage Harmonics 21	float	RO	
228	Phase 3 Voltage Harmonics 23	float	RO	
230	Phase 3 Voltage Harmonics 25	float	RO	
232	Phase 3 Voltage Harmonics 27	float	RO	
234	Phase 3 Voltage Harmonics 29	float	RO	
236	Phase 3 Voltage Harmonics 31	float	RO	
Phase-2 Current Harmonic Measurements				
238	Phase 3 Current Harmonics 1	float	RO	
240	Phase 3 Current Harmonics 3	float	RO	
242	Phase 3 Current Harmonics 5	float	RO	
244	Phase 3 Current Harmonics 7	float	RO	
246	Phase 3 Current Harmonics 9	float	RO	
248	Phase 3 Current Harmonics 11	float	RO	
250	Phase 3 Current Harmonics 13	float	RO	
252	Phase 3 Current Harmonics 15	float	RO	
254	Phase 3 Current Harmonics 17	float	RO	
256	Phase 3 Current Harmonics 19	float	RO	
258	Phase 3 Current Harmonics 21	float	RO	
260	Phase 3 Current Harmonics 23	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
262	Phase 3 Current Harmonics 25	float	RO	
264	Phase 3 Current Harmonics 27	float	RO	
266	Phase 3 Current Harmonics 29	float	RO	
268	Phase 3 Current Harmonics 31	float	RO	
Phase-1 Maximum Measurements				
270	Phase 1 Max. Voltage (L-N)	float	RO	
272	Phase 1-2 Max. Voltage (L-L)	float	RO	
274	Phase 1 Max. Current	float	RO	
276	Phase 1 Max. Cosφ	float	RO	
278	Phase 1 Max. Power Factor	float	RO	
280	Phase 1 Max. Active Power	float	RO	
282	Phase 1 Max. Reactive Power	float	RO	
284	Phase 1 Max. Apparent Power	float	RO	
286	Phase 1 Max. THDV	float	RO	
288	Phase 1 Max. THDI	float	RO	
Phase-2 Maximum Measurements				
290	Phase 2 Max. Voltage (L-N)	float	RO	
292	Phase 2-3 Max. Voltage (L-L)	float	RO	
294	Phase 2 Max. Current	float	RO	
296	Phase 2 Max. Cosφ	float	RO	
298	Phase 2 Max. Power Factor	float	RO	
300	Phase 2 Max. Active Power	float	RO	
302	Phase 2 Max. Reactive Power	float	RO	
304	Phase 2 Max. Apparent Power	float	RO	
306	Phase 2 Max. THDV	float	RO	
308	Phase 2 Max. THDI	float	RO	
Phase-3 Maximum Measurements				
310	Phase 3 Max. Voltage (L-N)	float	RO	
312	Phase 3-1 Max. Voltage (L-L)	float	RO	
314	Phase 3 Max. Current	float	RO	
316	Phase 3 Max. Cosφ	float	RO	
318	Phase 3 Max. Power Factor	float	RO	
320	Phase 3 Max. Active Power	float	RO	
322	Phase 3 Max. Reactive Power	float	RO	
324	Phase 3 Max. Apparent Power	float	RO	
326	Phase 3 Max. THDV	float	RO	
328	Phase 3 Max. THDI	float	RO	
Maximum Common Measurements (Phase-1, Phase-2, Phase-3)				
330	Max. Average Voltage (L-N)	float	RO	
332	Max. Average Voltage (L-L)	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
334	Max. Total Current	float	RO	
336	Max. System Power Factor	float	RO	
338	Max. Total Active Power	float	RO	
340	Max. Total Reactive Power	float	RO	
342	Max. Total Apparent Power	float	RO	
344	Max. System Frequency	float	RO	
346	Max. Neutral Current	float	RO	
Phase-1 Maximum Measurements				
348	Phase 1 Min. Voltage (L-N)	float	RO	
350	Phase 1-2 Min. Voltage (L-L)	float	RO	
352	Phase 1 Min. Current	float	RO	
354	Phase 1 Min. Cosφ	float	RO	
356	Phase 1 Min. Power Factor	float	RO	
358	Phase 1 Min. Active Power	float	RO	
360	Phase 1 Min. Reactive Power	float	RO	
362	Phase 1 Min. Apparent Power	float	RO	
364	Phase 1 Min. THDV	float	RO	
366	Phase 1 Min. THDI	float	RO	
Phase-2 Maximum Measurements				
368	Phase 2 Min. Voltage (L-N)	float	RO	
370	Phase 2-3 Min. Voltage (L-L)	float	RO	
372	Phase 2 Min. Current	float	RO	
374	Phase 2 Min. Cosφ	float	RO	
376	Phase 2 Min. Power Factor	float	RO	
378	Phase 2 Min. Active Power	float	RO	
380	Phase 2 Min. Reactive Power	float	RO	
382	Phase 2 Min. Apparent Power	float	RO	
384	Phase 2 Min. THDV	float	RO	
386	Phase 2 Min. THDI	float	RO	
Phase-3 Maximum Measurements				
388	Phase 3 Min. Voltage (L-N)	float	RO	
390	Phase 3-1 Min. Voltage (L-L)	float	RO	
392	Phase 3 Min. Current	float	RO	
394	Phase 3 Min. Cosφ	float	RO	
396	Phase 3 Min. Power Factor	float	RO	
398	Phase 3 Min. Active Power	float	RO	
400	Phase 3 Min. Reactive Power	float	RO	
402	Phase 3 Min. Apparent Power	float	RO	
404	Phase 3 Min. THDV	float	RO	
406	Phase 3 Min. THDI	float	RO	

Adress	Parametre	Type	Read / Write	Write Condition
Minimum Common Measurements (Phase-1, Phase-2, Phase-3)				
408	Min. Average Voltage (L-N)	float	RO	
410	Min. Average Voltage (L-L)	float	RO	
412	Min. Total Current	float	RO	
414	Min. System Power Factor	float	RO	
416	Min. Total Active Power	float	RO	
418	Min. Total Reactive Power	float	RO	
420	Min. Total Apparent Power	float	RO	
422	Min. System Frequency	float	RO	
424	Min. Neutral Current	float	RO	
Alarm Flags				
426	Alarm Flags	32 bit integer	RO	See Table 4.2
Demand Measurements				
428	Phase 1 Current Demand	float	RO	
430	Phase 2 Current Demand	float	RO	
432	Phase 3 Current Demand	float	RO	
434	Total Current Demand	float	RO	
436	Phase 1 Active Power Demand	float	RO	
438	Phase 2 Active Power Demand	float	RO	
440	Phase 3 Active Power Demand	float	RO	
442	Total Active Power Demand	float	RO	
444	Phase 1 Reactive Power Demand	float	RO	
446	Phase 2 Reactive Power Demand	float	RO	
448	Phase 3 Reactive Power Demand	float	RO	
450	Total Reactive Power Demand	float	RO	
452	Phase 1 Apparent Power Demand	float	RO	
454	Phase 2 Apparent Power Demand	float	RO	
456	Phase 3 Apparent Power Demand	float	RO	
458	Total Apparent Power Demand	float	RO	
Digital Input				
460	Digital Input 1 Counter	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
462	Digital Input 2 Counter	32 bit integer	R / W	
464	Run Hour Counter	32 bit integer	R / W	
466	On Hour Counter	32 bit integer	RO	
468	Power Interruptions Counter	32 bit integer	RO	
Energy Meters				

Adress	Parametre	Type	Read / Write	Write Condition
Tariff 1 Total Energy Values (Phase1+Phase2+Phase3)				
470	Import Active Energy T1 (Tariff 1)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
472	Export Active Energy T1 (Tariff 1)	32 bit integer	R / W	
474	Import Reactive Energy T1 (Tariff 1)	32 bit integer	R / W	
476	Export Reactive Energy T1 (Tariff 1)	32 bit integer	R / W	
Tariff 2 Total Energy Values (Phase1+Phase2+Phase3)				
478	Import Active Energy T2 (Tariff 2)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
480	Export Active Energy T2 (Tariff 2)	32 bit integer	R / W	
482	Import Reactive Energy T2 (Tariff 2)	32 bit integer	R / W	
484	Export Reactive Energy T2 (Tariff 2)	32 bit integer	R / W	
Tariff 1 Phase1 Energy Values				
486	Import Active Energy T1-Phase1 (Tariff 1)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
488	Export Active Energy T1-Phase1 (Tariff 1)	32 bit integer	R / W	
490	Import Reactive Energy T1-Phase1 (Tariff 1)	32 bit integer	R / W	
492	Export Reactive Energy T1-Phase1 (Tariff 1)	32 bit integer	R / W	
Tariff 1 Phase 2 Energy Values				
494	Import Active Energy T1-Phase2 (Tariff 1)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
496	Export Active Energy T1-Phase2 (Tariff 1)	32 bit integer	R / W	
498	Import Reactive Energy T1-Phase2 (Tariff 1)	32 bit integer	R / W	
500	Export Reactive Energy T1-Phase2 (Tariff 1)	32 bit integer	R / W	
Tariff 1 Phase 3 Energy Values				
502	Import Active Energy T1-Phase3 (Tariff 1)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
504	Export Active Energy T1-Phase3 (Tariff 1)	32 bit integer	R / W	
506	Import Reactive Energy T1-Phase3 (Tariff 1)	32 bit integer	R / W	
508	Export Reactive Energy T1-Phase3 (Tariff 1)	32 bit integer	R / W	
Tariff 2 Phase 1 Energy Values				
510	Import Active Energy T2-Phase1 (Tariff 2)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
512	Export Active Energy T2-Phase1 (Tariff 2)	32 bit integer	R / W	
514	Import Reactive Energy T2-Phase1 (Tariff 2)	32 bit integer	R / W	
516	Export Reactive Energy T2-Phase1 (Tariff 2)	32 bit integer	R / W	
Tariff 2 Phase 2 Energy Values				
518	Import Active Energy T2-Phase2 (Tariff 2)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
520	Export Active Energy T2-Phase2 (Tariff 2)	32 bit integer	R / W	
522	Import Reactive Energy T2-Phase2 (Tariff 2)	32 bit integer	R / W	
524	Export Reactive Energy T2-Phase2 (Tariff 2)	32 bit integer	R / W	
Tariff 2 Phase 3 Energy Values				
526	Import Active Energy T2-Phase3 (Tariff 2)	32 bit integer	R / W	If password protection is active, enter the password in the "Settings Protection" field and then enter "2222" in the "Enable Counter Change" field. You can then enter the value.
528	Export Active Energy T2-Phase3 (Tariff 2)	32 bit integer	R / W	
530	Import Reactive Energy T2-Phase3 (Tariff 2)	32 bit integer	R / W	
532	Export Reactive Energy T2-Phase3 (Tariff 2)	32 bit integer	R / W	

Adress	Parametre	Type	Read / Write	Write Condition
534	Current Transfer Rate (CTR)	32 bit integer	R / W	Enter the password in the "Settings Protection" field if password protection is enabled.
536	Voltage Transfer Rate (VTR)	float	R / W	
538	Connection Type	32 bit integer	R / W	
540	Relay 1 Function	32 bit integer	R / W	
542	Relay 2 Function	32 bit integer	R / W	
544	Demand Time	32 bit integer	R / W	
546	Password Enable	32 bit integer	R / W	
548	Password Activation Time	32 bit integer	R / W	
550	Password Value	32 bit integer	R / W	
552	Baud Rate	32 bit integer	R / W	
554	Slave ID	32 bit integer	R / W	
556	Parity Control	32 bit integer	R / W	
558	Digital Input 1 Type	32 bit integer	R / W	
560	Digital Input 1 Delay Time	32 bit integer	R / W	
562	Digital Input 1 Edge	32 bit integer	R / W	
564	Digital Input 2 Type	32 bit integer	R / W	
566	Digital Input 2 Delay Time	32 bit integer	R / W	
568	Digital Input 2 Edge	32 bit integer	R / W	
570	Pulse Output 1 Parameter	32 bit integer	R / W	
572	Pulse Output 1 Duration	32 bit integer	R / W	
574	Pulse Output 1 Rate	32 bit integer	R / W	
576	Pulse Output 2 Parameter	32 bit integer	R / W	
578	Pulse Output 2 Duration	32 bit integer	R / W	
580	Pulse Output 2 Rate	32 bit integer	R / W	
582	Menu Scroll On/Off	32 bit integer	R / W	
584	Menu Display Period	32 bit integer	R / W	
586	Home page Setup	32 bit integer	R / W	
588	Display backlight options	32 bit integer	R / W	
590	Display backlight on time	32 bit integer	R / W	
Alarm Settings				
592	Voltage (L-N) Alarm High Limit	float	R / W	Enter the password in the "Settings Protection" field if password protection is enabled.
594	Voltage (L-N) Alarm Low Limit	float	R / W	
596	Voltage (L-N) Alarm Hysteresis	float	R / W	
598	Voltage (L-N) Alarm Delay Time	32 bit integer	R / W	
600	Voltage (L-L) Alarm High Limit	float	R / W	
602	Voltage (L-L) Alarm Low Limit	float	R / W	
604	Voltage (L-L) Alarm Hysteresis	float	R / W	
606	Voltage (L-L) Alarm Delay Time	32 bit integer	R / W	
608	Current Alarm High Limit	float	R / W	
610	Current Alarm Low Limit	float	R / W	
612	Current Alarm Hysteresis	float	R / W	
614	Current Alarm Delay Time	32 bit integer	R / W	
616	Neutral Current Alarm High Limit	float	R / W	
618	Neutral Current Alarm Low Limit	float	R / W	
620	Neutral Current Alarm Hysteresis	float	R / W	

Adress	Parametre	Type	Read / Write	Write Condition
622	Neutral Current Alarm Delay Time	32 bit integer	R / W	Enter the password in the "Settings Protection" field if password protection is enabled.
624	Cosφ Alarm High Limit	float	R / W	
626	Cosφ Alarm Low Limit	float	R / W	
628	Cosφ Alarm Hysteresis	float	R / W	
630	Cosφ Alarm Delay Time	32 bit integer	R / W	
632	Power Factor Alarm High Limit	float	R / W	
634	Power Factor Alarm Low Limit	float	R / W	
636	Power Factor Alarm Hysteresis	float	R / W	
638	Power Factor Alarm Delay Time	32 bit integer	R / W	
640	Frequency Alarm High Limit	float	R / W	
642	Frequency Alarm Low Limit	float	R / W	
644	Frequency Alarm Hysteresis	float	R / W	
646	Frequency Alarm Delay Time	32 bit integer	R / W	
Device Model				
648	Device Firmware Version	float	RO	
650	Device Model	32 bit integer	RO	
Password /Pin activation				
652	Setting protection	32 bit integer	R / W	Address for the device password. It displays the enabled/disabled condition of the password protection when reading using
Reset Commands				
1000	Reset Energy Values	32 bit integer	WO	Enter the password in the "Settings Protection" field if password protection is enabled. Enter "1" into the respective address to reset the values. Enter "0" before saving to restore the values.
1002	Reset Counter Values	32 bit integer	WO	
1004	Reset Max. Values	32 bit integer	WO	
1006	Reset Min. Values	32 bit integer	WO	
1008	Reset Demand Values	32 bit integer	WO	
1010	Reset Settings	32 bit integer	WO	
1012	Reset Alarm Limits	32 bit integer	WO	
1014	Reset the Device to Factory Settings	32 bit integer	WO	
Save The Changes				
2000	Save Changes	32 bit integer	WO	Enter the password in the "Settings Protection" field if password protection is enabled. Enter "1" to save the changes and restart.
Manual Output Relay Control				
4000	Enable Relay Control	32 bit integer	WO	Enter the password in the "Settings Protection" field if password protection is enabled. Enter "1111" here to enable the relay control. Enter "0" here to disable the relay control.
4002	Relay 1 Control	32 bit integer	WO	Enter the password in the "Settings Protection" field if password prote- ction is enabled. Then, enter "1111" for the "Enable Relay Control" address. Enter "1" to activate, "0" to de-activate the relay.
4004	Relay 1 Control	32 bit integer	WO	Enter the password in the "Settings Protection" field if password prote- ction is enabled. Then, enter "1111" for the "Enable Relay Control" address. Enter "1" to activate, "0" to de-activate the relay.

Adress	Parametre	Type	Read / Write	Write Condition
Enable/Disable to Assigning Predefined Value for Energy Meters				
5000	Enable Counter Change	32 bit integer	WO	Enter the password in the "Settings Protection" field if password protection is enabled. Enter "2222" here to enable assigning the relay control. Enter "0" here to disable the meter assignment.

4.1.1 Status/Alarm Flags

"Alarm Flags" modbus address showing the alarm conditions and alarm conditions represented with bits are given below.

Table 4-2 Alarm Flags

458 Alarm Flags															
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
DI2 Status	DI1 Status	Relay 2 Status	Relay 2 Status	DO2 Status	DO1 Status	Reserve/OFF					SEQ	I3 OFF	I2 OFF	I1 OFF	V3 OFF
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
V2 OFF	V1 OFF	Freq Low	Freq High	PF Low	PF High	Cosφ Low	Cosφ High	I(Nötr) Low	I(Nötr) High	I Low	I High	V(L-L) Low	V(L-L) High	V(L-N) Low	V(L-N) High

bit	Description
31	: DI2 Status: Digitial input 2 signal condition (active or passive)
30	: DI1 Status: Digitial input 1 signal condition (active or passive)
29	: DI1 Status: Digitial input 1 signal condition (active or passive)
28	: Relay 1 Status: Relay 1 active/pasive status
27	: DO2 Status: Digital Output 2 active/pasive status
26	: DO1 Status: Digital Output 1 active/pasive status
25-21	: Reserve
20	: SEQ - Phase Order Alarm
19	: I3 OFF - 3. No current in Line-3
18	: I2 OFF - 2. No current in Line-2
17	: I1 OFF - 1. No current in Line-1
16	: V3 OFF - 3. No voltage in Line-3
15	: V2 OFF - 2. No voltage Line-2
14	: V1 OFF - 1. No voltage in Line-1
13	: Freq Low - Low frequency alarm
12	: Freq High - High frequency alarm
11	: PF Low - Low power factor alarm
10	: PF High - High power factor alarm
9	: Cos φ Low - Low Cos φ alarm
8	: Cos φ High - High Cos φ alarm
7	: I(N) Low - Low neutral current alarm
6	: I(N) High - High neutral current alarm
5	: I Low - Low current alarm
4	: I High - High current alarm
3	: V(L-L) Low - Low phase-phase voltage alarm
2	: V(L-L) High - High phase-phase voltage alarm
1	: V(L-N) Low - Low phase-neutral voltage alarm
0	: V(L-N) High - High phase-neutral voltage alarm

If the device was not restarted after entering the password or the “password activation time” has not elapsed, this will read “0” to indicate that password protection is disabled in the “Settings protection” address(modbus adr: 604). In this case, you don’t need to re-enter the password.
Password activation time resets and restarts each time a modbus write action is performed or a key is pressed.

4.2 Multiple Choice Settings via Modbus

Modbus addresses for the multiple choice settings, input values and their descriptions are given below.

Table 4-3 Description List

Adress	register name	Write value	Description name
538	Connection Type	0	3P4W
		1	3P3W
540	Relay 1 Function	0	OFF
		1	LOW
		2	HIGH
542	Relay 2 Function	0	OFF
		1	LOW
		2	HIGH
546	Password Enable	0	OFF
		1	ON
552	Baud Rate	0	1200 baud
		1	2400 baud
		2	4800 baud
		3	9600 baud
		4	19200 baud
		5	38400 baud
		6	57600 baud
556	Party Control	0	NONE
		1	EVEN
		2	ODD
558	Digital Input 1 Type	0	OFF
		1	TARIFF 2
		2	COUNTER
		3	RUN HOUR
562	Sayısal Giriş 1 Edge	0	RISING
		1	FALLING
		2	BOTH EDG
564	Sayısal Giriş 1 Edge	0	OFF
		1	TARIFF 2
		2	COUNTER
		3	RUN HOUR
568	Digital Input 2 Edge	0	RISING
		1	FALLING
		2	BOTH EDG
570	Pulse Output 1 Parameter	0	OFF
		1	IMP ACT1
		2	EXP ACT1
		3	IMP REA1
		4	EXP REA1
		5	IMP ACT2
		6	EXP ACT2
		7	IMP REA2
		8	EXP REA2
		9	DIN1
		10	DIN2

Adress	register name	Write value	Description name
576	Pulse Output 2 Parameter	0	OFF
		1	IMP ACT1
		2	EXP ACT1
		3	IMP REA1
		4	EXP REA1
		5	IMP ACT2
		6	EXP ACT2
		7	IMP REA2
		8	EXP REA2
		9	DIN1
		10	DIN2
582	Menu Scroll On/Of	0	OFF
		1	ON
586	Home Page Settings	0	VOLTAGE(L-N)
		1	VOLTAGE(L-L)
		2	CURRENT
		3	I NEUTR
		4	COSQ
		5	PF
		6	POWER P
		7	POWER Q
		8	POWER S
		9	Σ P-Q-S
		10	FREQ
		11	THD V
		12	THD I
		13	ENERGY
588	Display Backlights Options	0	TIME DEP
		1	CONT ON
		2	CONT OFF


KLEA
220P
POWYS
3121-3122
Energy
Analyzer
SECTION 5
FACTORY
DEFAULT
SETTINGS

SECTION 5 FACTORY DEFAULT SETTINGS

Menu	Sub Menu 1	Sub Menu 2	Description	Default Value	Unit	Setting Range
BASIC	Ctr		Current transformer ratio	1	-	1-5000
	Utr		Voltage transformer ratio	1.0	-	0.1 - 5000.0
	Conn		Connection type options	3P4W	-	3P4W/3P3W
ALARMS	VLN ALM	HI	Voltage (phase-neutral) alarm high limit	0.0	V	0.0 - 1500000.0
		LO	Voltage (phase-neutral) alarm low limit	0.0	V	0.0 - 1500000.0
		hYSt	Voltage (phase-neutral) alarm hysteresis value	5.0	V	0.0 - 1500000.0
		dlY.t	Voltage (phase-neutral) alarm delay time	5	sn	0 - 60
	VLL ALM	HI	Voltage (phase-phase) alarm high limit	0.0	V	0.0 - 2600000.0
		LO	Voltage (phase-phase) alarm high low limit	0.0	V	0.0 - 2600000.0
		hYSt	Voltage (phase-phase) alarm hysteresis value	5.0	V	0.0 - 2600000.0
		dlY.t	Voltage (phase-phase) alarm delay time	5	sn	0 - 60
	I ALM	HI	Current alarm high limit	0.0	A	0.0 - 30000.0
		LO	Current alarm low limit	0.0	A	0.0 - 30000.0
		hYSt	Current alarm hysteresis value	0.1	A	0.0 - 30000.0
		dlY.t	Current alarm delay value	5	sn	0 -60
	IN ALM	HI	Neutral current alarm high limit	0.0	A	0.0 - 30000.0
		LO	Neutral current alarm low limit	0.0	A	0.0 - 30000.0
		hYSt	Neutral current hysteresis value	0.1	A	0.0 - 30000.0
		dlY.t	Neutral current alarm delay value	5	sn	0 - 60
	COSQ ALM	HI	cos φ alarm high limit	0.00	-	0.00 - 1.00
		LO	cos φ alarm low limit	0.00	-	0.00 - 1.00
		hYSt	cos φ alarm hysteresis value	0.01	-	0.00 - 1.00
		dlY.t	cos φ alarm delay time	5	sn	0 - 60

Menu	Sub Menu 1	Sub Menu 2	Description	Default Value	Unit	Setting Range
ALARMS	PF ALM	HI	Power factor alarm high limit	0.00	-	0.00 - 1.00
		LO	Power factor alarm low limit	0.00	-	0.00 - 1.00
		hYSt	Power factor alarm hysteresis value	0.01	-	0.00 - 1.00
		dlY.t	Power factor alarm delay time	5	sn	0 - 60
	FREQ ALM	HI	Frequency alarm high limit	50.0	Hz	45.0 - 65.0
		LO	Frequency alarm low limit	50.0	Hz	45.0 - 65.0
		hYSt	Frequency alarm hysteresis value	2.0	Hz	0.0 - 20.0
		dlY.t	Frequency alarm delay time	5	sn	0 - 60
RELAYS	rLY1		Relay 1 setup	OFF	-	OFF/LOW/HIGH
	rLY2		Relay 2 setup	OFF	-	OFF/LOW/HIGH
DEMAND	dEd.s		Demand time setup	15	dk	1 - 60
RS485	bAud		Baud rate options	38400	Baud	1200/2400/4800/9600/19200/38400/57600
	Id		Slave ID setup	1	-	1 - 247
	PrtY		Parity check setup	NONE	-	NONE/EVEN/ODD
DI INPUT	INPUT1	tYPE	Digital input 1 options	OFF	-	OFF/TARIFF 2/COUNTER/RUN HOUR
		dLY	Digital input 1 detection delay time	10	msn	10 - 2000
		EdgE	Digital input 1 detection edge	RISING	-	RISING/FALLING/BOTH EDG
	INPUT2	tYPE	Digital input 2 options	OFF	-	OFF/TARIFF 2/COUNTER/RUN HOUR
		dLY	Digital input 2 detection delay time	10	msn	10 - 2000
			Digital input 2 detection edge	RISING	-	RISING/FALLING/BOTH EDG
PULSE	OUT1	OUT	Pulse output 1 parameter setup	OFF	-	OFF / IMP ACT1 / EXP ACT1 / IMP REA1 / EXP REA1 / IMP ACT2 / EXP ACT2 / IMP REA2 / EXP REA2 / DIN1 / DIN2
		durA	Pulse duration of the pulse output 1	50	msn	50 - 2500
		rAt	Step range for pulse output 1	1	kWh / kVArh - Wh / VArh / Qty	1 - 99 999 999
	OUT2	OUT	Pulse output 2 parameter setup	OFF	-	OFF / IMP ACT1 / EXP ACT1 / IMP REA1 / EXP REA1 / IMP ACT2 / EXP ACT2 / IMP REA2 / EXP REA2 / DIN1 / DIN2
		durA	Pulse duration of the pulse output 2	50	msn	50 - 2500
			Step range for pulse output 2	1	kWh / kVArh - Wh / VArh / Qty	1 - 99 999 999

Menu	Sub Menu 1	Sub Menu 2	Description	Default Value	Unit	Setting Range
SECURITY	**Act**		Enable/disable password protection	NO	-	NO/YES
	Pin.t		Timeout for password protection	10	dk	1 - 60
	Pin		Change password	1	-	1 - 9999
DISPLAY	MENU	**ScrL**	Menu scroll on/off	OFF	-	OFF/ON
		Scr.P	Menu display time	3	sn	1 - 60
		Strt	Home page setup	VOLTAGE LN	-	VOLTAGELN / VOLTAGELL / CURRENT / I NEUTR / COSQ / PF / POWER P / POWER Q / POWER S / Σ P-Q-S / FREQ / THD V / THD I / EENRGY
	BACKLGHT	**oPt**	Display backlight options	TIME DEP	-	TIME DEP/CONT ON/CONT OFF
		durA	Display backlight on time	600	sn	10 - 600
CLEAR	CLr		Clear menu	OFF	-	OFF / ALL / ENERGY / COUNTERS / MAX VALS / MIN VALS / DEMANDS / SETTINGS / ALARMS


KLEA
220P
POWYS
3121-3122
Energy
Analyzer
SECTION 6
TECHNICAL
SPECIFICATIONS

SECTION 6 TECHNICAL SPECIFICATIONS

Supply		
Voltage	85..300 V AC/DC, 18..70 VDC(606190)	
Frequency	45..65Hz	
Power Consumption	< 4.5VA & <2W	
Measurement Inputs		
Voltage	5..300V AC (L - N)	
	10..500V AC (L - L)	
Current	10mA .. 6A AC	
Frequency	45..65Hz	
Network Connection Type	3 phase 4 wire, 3 phase 3 wire	
Digital Input		
Input Type	Dry Contact	
Isolation	5000V RMS	
Digital Output		
Output Type	Transistor	
Switching Voltage	5..30V DC	
Switching Current	50mA	
Isolation	5000V RMS	
Realy Output		
	AC	**DC**
Maximum Switching Voltage	250V	30V
Maximum Switching Current	10A	5A
Maximum Switching Power	1250VA	150W
General		
Operating Temperature	-20°C..+70°C	
Storage Temperature	-30°C..+80°C	
Protection Class	IP40	
Relative Humidity	%95 non-condensing	

Measurement Accuracy				
Symbol	Measurement Type	Class According to IEC 61557-12	Measurement Range	Other Standards
P	Total Active Power	0,5	1 % $I_n \leq I \leq I_{max}$ 0,5 Ind to 0,8 Cap	-
Q_V	Total Reactive Power	1	2 % $I_n \leq I \leq I_{max}$ 0,25 Ind to 0,25 Cap	-
tS_A	Total Apparent Power	0,5	2% $I_n \leq I \leq I_{max}$	-
E_A	Total Active Energy	0,5	0 to 49999999999	IEC 62053-22 Class 0.5S
E_{rV}	Total Reactive Energy	2	0 to 49999999999	IEC 62053-23 Class 2
f	Frequency	0,1	45 – 65 Hz	-
I	Phase Current	0,5	10 % $I_n \leq I \leq I_{max}$	-
I_{Nc}	Neutral Current (Measured)	0,5	10 % $I_n \leq I \leq I_{max}$	-
U	Voltage	0,2	$U_{min} \leq U \leq U_{max}$	-
PF_A	Power Factor	0,5	0,5 Ind to 0,8 Cap	-
THDV	Total Harmonic Distortion Voltage	1	0 % to 20 %	-
THDI	Total Harmonic Distortion Current	1	0 % to 100 %	-

Kızılüzüm Mahallesi Kemalpaşa Kızılüzüm Cad. No:15 - 35730
Kemalpaşa - İzmir / TURKEY Tel: (+90 232) 877 08 00 Fax: (+90 232) 877 08 06

www.klemsan.com / info@klemsan.com.tr

Klemsan®

Revision No: 09032021