Klemsan®

606100 KLEA 320P

3Ø Energy Analyzer

General	Seven Segment Display	-
	LCD Screen	✓
	Language Support	Turkish, English, Russian
	Battery	✓
	Real Time Clock	✓
	Password Protection	✓
	Current Transformer Ratio	1 - 5000
	Voltage Transformer Ratio	1 - 5000
	Demand Period	1-60 min. adjustable
	Connection Type	3F4T, 3F3T, Aron
	Measurements in Quadrants	4
	Number of Measurements in a Period	512
	LCD/Display Refresh Period	1sn
	Networks	TT, TN, IT
	Phasor Diagram	✓
	Signal Waveforms	✓
	Min./Max./Demand Values	✓
Energy Measurement	Number of Tariffs	2
	Multi Sub-Tariffs (Peak, Day and Off-Peak)	✓
	1Ø Phase Energy Meters	-
	3Ø Phase Energy Meters	✓
	4 Quadrant Reactive Energy Meters	-
Current Measurement Input	Measurement Range	10mA - 6A AC

	Overvoltage Category	300 V Cat II
	Measurement Surge Voltage	2 kV
	Power Consumption	<0.2 VA
	Intermittent Overload	100 A for 1 sec.
	Sampling Frequency between 45-65 Hz	25.6 kHz
Voltage Measurement Input	Overvoltage Category	300 V Cat III
	Measured Range L-N	1-300 Vrms
	Measured Range L-L	2-500 Vrms
	Measured Frequency Range	45-65 Hz
	Power Consumption	<0.1 VA
	Sampling Frequency between 45-65 Hz	25.6 kHz
Power Quality Measurements	Harmonics for Current and Voltage Phases	Up to 51st
	THD - Voltage in %	✓
	THD - Current in %	✓
Other Measurements	Run Hour (Operating Time for Load in Hours)	-
	On Hour (Operating Time for Meter in Hours)	-
	Int Counter (Number of Power Interruptions)	-
According to IEC 61557-12	Total Active Power	Class 0.2
	Total Reactive Power	Class 1
	Total Apparent Power	Class 0.2
	Total Active Energy	Class 0.5
	Total Reactive Energy	Class 2
	Frequency	Class 0.05
	Current	Class 0.2
	Neutral Current	Class 0.5
	Voltage	Class 0.2
	Power Factor	Class 0.5
	THDV, THDI	Class 1
According to IEC 62053-22	Total Active Energy	Class 0.2S
According to IEC 62053-23	Total Reactive Energy	Class 2

Alarm Relay Outputs	Number of Outputs	2
	Type	NO (SPST)
	Max. Switching Current	10 A
	Max. Switching Voltage	250 VAC
	Max. Switching Power	1250 VA
Digital Inputs	Number of Inputs	2
	Minimum Counting Frequency	100 Hz, 10 ms
	Input Present or Not	Dry Contact
	Isolation Level	5000 Vrms
Digital Outputs	Number of Outputs	2
	Type	Transistör
	Switching Voltage Range	5-30 VDC
	Minimum Switching Frequency	20 Hz, 50 ms
	Isolation Level	5000 Vrms
Analog Outputs	Number of Outputs	-
	Range of Outputs 0-5 V, 0-10 V, -5-5 V, -10-10V, 0-20 mA, 4-20 mA	-
	Isolation	-
Voltage	AC	85-300V
	DC	85-300V
Consumption	AC	<3VA
	DC	<2.5W
Supply	Frequency	45-65Hz
Min./Max./Avg. Values	Hourly Records	1920 Hours x 68 Different Paramaters
	Daily Records	240 Days x 68 Different Paramaters
	Monthly Records	36 Months x 68 Different Parameters
Data Logging with timestamp	Demand	4 Months x 16 Different Parameters
	Alarm Records	50
Communication	Protocol	Modbus RTU
	Baud Rate	2400-115200 bps adjustable

	Parity Number	None
	Stop Bit	1
	Address	1-247
	Isolation	2750V RMS
Mechanical Properties	Weight (g)	404 g
	Protection Class	Front IP40 / Rear IP20
	Mounting Type	Panel Mount
Supply, Voltage, Current, Relay Outputs	Stranded:	2.5mm² - 14AWG
	Solid:	4mm² - 12AWG, 2x1.5mm² - 2x16AWG
Digital I/O, RS 485, Analog Output	Stranded:	1.5mm² - 16AWG
	Solid:	1.5mm² - 16AWG, 2x0.75mm² - 2x18AWG
Ambient Conditions	Operating Temperature	-20 to +70°C
	Storing Temperature	-30 to +80°C
	Relative Humidity (No Condensation)	Maks. 95%
EMC-EMI	300 VAC CAT II according to IEC 61010-1	✓
	EN 55011/A1:2010, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN61000-4-11	✓
General		
	Dimensions	

IP 66 Silicon Cover

- Silicone Cover-IP66 Silicone Cover (96x96mm)

Türk Standartlarına Uygunluk Belgesi - TSE Certificate

Avrupa standartlarına uygunluk belgesi - CE Certificate

Order Info

UTOR / USB to RS485,RS232 and TTL Converter

UTOR series products,

- USB to RS485
- USB to RS232
- Provides TTL conversion from USB.
- UTOR is powered from the USB port without the need for an external power supply. Unlike most converters, UTOR has an isolation barrier that provides electrical isolation between your computer and serial devices. This creates an ideal environment where equipment and data are critical.

						
Type			UTOR-4i	UTOR-2i	UTOR-T5i	UTORT3i
Definition			Isolated RS485 to USB Converter	Isolated RS232 to USB Converter	Isolated TTL(5V) to USB Converter	Isolated TTL(3V) to USB Converter
Order Number			601 430	601 431	601 432	601 433
Interface	USB	Compatibility	USB 1.1 and USB 2.0	USB 1.1 and USB 2.1	USB 1.1 and USB 2.2	USB 1.1 and USB 2.3
		Connector	USB Type A	USB Type A	USB Type A	USB Type A
	Serial	Port Number	1	1	1	1
		Standart	RS485	RS232	TTL(5V)	TTL(3.3V)
		Connector	Removable terminal block with screw connection	Removable terminal block with screw connection	Removable terminal block with screw connection	Removable terminal block with screw connection
		Isolation	2500Vrms	2500Vrms	2500Vrms	2500Vrms
		Baudrate	300 .. 115200 bps	300 .. 115200 bps	300 .. 115200 bps	300 .. 115200 bps
		Stop Bits	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2	1, 1.5, 2
		Data Bits	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8	5, 6, 7, 8
		Parity	None, Even, Odd	None, Even, Odd	None, Even, Odd	None, Even, Odd
		Terminals	D+,D-	Tx, Rx	Tx, Rx	Tx, Rx
Voltage Supply			via USB port	via USB port	via USB port	via USB port
Permissible Ambient Temperature		During Operation	-20°C..+60°C	-20°C..+60°C	-20°C..+60°C	-20°C..+60°C
		During Storage	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C
Relative Humidity			Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Degree of Protection			IP20	IP20	IP20	IP20
Accesorries 			Available	Available	Available	Available

Energy Monitoring
Solutions

More efficiency
than you expected

Defining an energy analyzer in simple terms

An energy analzer is an automation device which offers 3-phase energy monitoring, analyzing and controlling the network comprehensively. It enables advanced applications such as energy metering, data logging, DIO applications, transducer applications etc.

Which actions are executed?

An energy analyzer provides highly accurate measuring for main electrical parameters and expanded energy metering solutions for your electrical network.

All the data which are being measured or kept in its memory can be transmitted to remote monitoring system thanks to modbus communication.

It offers 3-phase energy and power measurement with data logging such as min/max/avg values, energy values, demand values etc. with date and time.

Digital inputs can be used for equipment status/position monitoring, activation second tariff which is used by generators or as a counter.

Digital outputs can be used to take an impulse which is synchronized with internal energy meters.

It provides conversion of main electrical parameters into DC voltage or DC mA outputs thanks to analogue outputs which can be easily programmed by the users.

Low/high limit thresholds for all electrical paramaters can be defined so load management in a network is possible by means of alarm relay outputs.

In dept-analysis of individual current and voltage harmonics in order to increase network quality.

Displaying signal waveforms for current and voltage phases to detect signal deviations which are observed in real time.

Detailed analyze of phase relationships between current and voltage lines thanks to phasor diagram feature.

Specifying run hours, on hours and power interruptions in order for your machines to be used more effectively.

Measuring
Metering
Communicating
Alarming
Harmonic monitoring
Counting
Waveform displaying
Taking impulse
Converting
Data logging
Phasor analyzing
Specifying hour meters

Which markets are they used frequently?

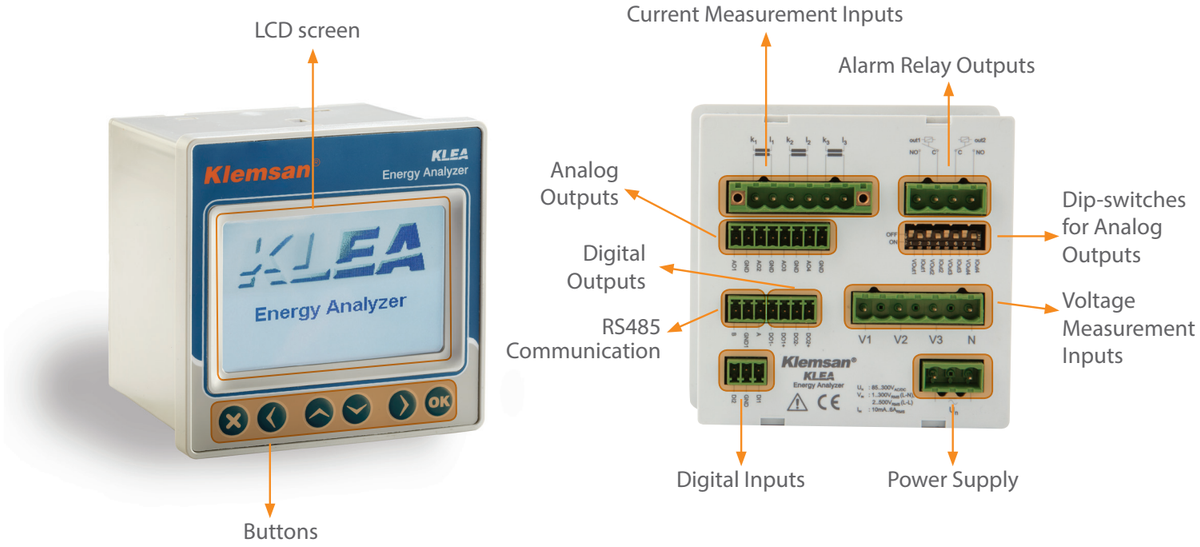
- Medium voltage modular cabinets
- Submetering station
- PLC-Scada applications
- Electrical power plants and substations
- Electric utilities
- Enery meter applications
- Infrastructure
- Alarm station
- IT centres
- High-rise buildings

Benefits and Advantages

- Current inputs can withstand surges up to 100 A for 1 second
- State of the art technology; moduler design, no connector cables, no fixing screws inside
- Panel or rail mount options
- 3 phase and 1 phase options
- Adjustable multi-tariff energy meter
- 4 quadrant measurement
- Harmonic measurement up to 51st
- Programmable analog outputs
- Programmable digital inputs and outputs
- Prgrammable alarm output
- Modbus communication
- Long distance visibility with super bright seven segment displays
- AC/DC power supply
- Real time clock
- Connection to current transformer x/1 A or x/5 A
- High measurement accuracy according to IEC standarts
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences
- Self-Extinguishing plastic housing.

Layout & Mounting

Klemsan measuring devices are suitable for panel mounting for 96x96mm standarts or for snap mounting onto 35 mm standards DIN rails.



KLEA 324P Energy Analyzer

Dual Source Energy Measurement

Recording and displaying the consumption of the energy from two different sources; network and generator. Users can set Tariff 2 to measure genset usage as a power supply so exact cost of the energy for network and genset can be identified more easily.

ENERGY ANALYZER
KLEA and POWYS series

Equipment Maintenance

Monitoring elapsed hours for equipment warranty, recording actual running hours for equipment resale, tracking running time for equipment service thanks to Run hour, On hour and Power interruption counter features.

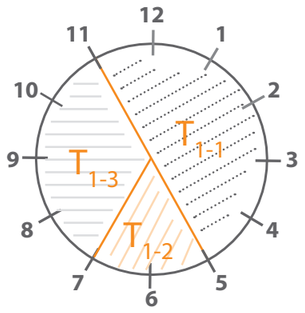
ENERGY ANALYZER
KLEA 110P
KLEA 220P
POWYS 3121 …

Buildings and Infrastructure

The main consumers can be identified by measuring the energy consumption of the various sub-assemblies in your buildings. So energy costs that belong to the departments can be managed and distributed between the various users thanks to submetering function. By correctly detecting peak demands in consumption gives you opportunity to reduce your electricity bills.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

Sub-metering Station



User can use these sub-tariffs in order to measure energy consumption for different shifts in a facility. In addition to Tariff 2, Tariff 1 is splitted into three pieces with adjustable start & end times for each sub-tariff.

ENERGY ANALYZER
KLEA 3xxx Series

PLC-Scada Applications

Conversion of measured electrical parameters such as voltage, current, active power, reactive power, frequency etc. can be converted to a DC output which is connected to analog input of PLC module by means of power transducer. So it is possible to integrate network measurands with a scada system.

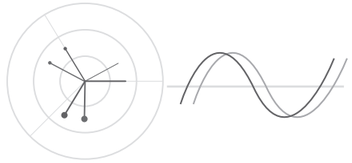
POWER TRANSDUCER
DNPT

Cost Management

Industry faces a never ending challenge to keep down its operating costs. One of the prerequisites for achieving this goal is to identify where costs occur. Energy analyzers present best solution to detect, analyze and prevent them thanks to their advanced multi-tariff meters and real time demand logs.

ENERGY ANALYZER
KLEA 3xxx Series

Signal Analyzing



Advanced monitoring of current and voltage waveforms, monitoring signal disturbances, detailed analyze of phase relationships.

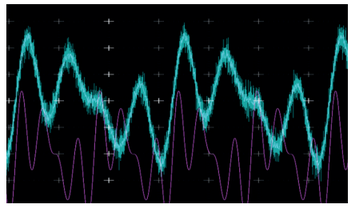
ENERGY ANALYZER
KLEA 3xxx Series

Remote Monitoring

All measured parameters are transmitted to a PC through RS485 so that keep you informed of system performance 24 hours per day. Parameters can be changed remotely and a variety of measured values can be monitored, analyzed and downloaded via a Web browser with using an energy management softwares and ethernet gateway from anywhere in the world.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

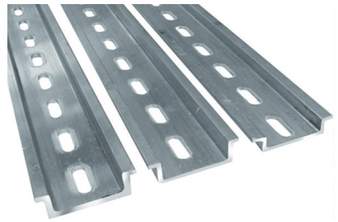
Pulse Concentration Applications



Klemsan energy analyzers offer several meters which are suitable all type of electrical networks. The pulse output function enables the kWh/kVArh consumption to be exported to a concentrator so that they can be analyzed for energy saving and billing purpuses.

ENERGY ANALYZER
KLEA and POWYS Series

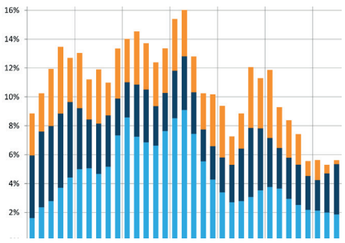
Din-Rail Applications



Installation costs are significantly decreased by the installation of measurement devices on a standart 35mm din-rail instead of mount them in a panel. This means that panel cut-out is no longer necesarry so time and energy can be saved.

ANALZER/ POWER TRANSDCUER
POWYS and DNPT Series

Demand Management



Measuring demand values for active power with date and time helps identifying time periods when energy use is very high so that unnecessary and unexpected costs can be detected and reduced.

ENERGY ANALYZER
KLEA 3xxx Series

Load Management by means of Alarm Outputs

Fully programmable alarm function for any electrical parameter which is measured by the product, gives you opportunity to define pickup setpoint, dropout setpoint and time delay in order to detect a fault condition and prevent it with activating alarm outputs before it's too late.

ANALYZER / MULTIMETER
KLEA, ECRAS and POWYS Series

Facility Management

DNPT series transducers provide all requirements of entire facility such as monitoring and conversion of mono/three phase electrical parameters, remote communication, 2 relay output, 2 DIO, 4 analog output, advanced multi-tariff energy meters. Briefly all power management needs are provided by only one product.

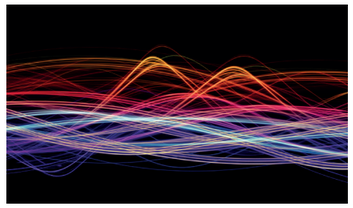
POWER TRANSDUCER
DNPT

Counting Quantities

Production quantity can be collected by a limit switch or a dry contact coming from a proximity sensor thanks to digital input feature.

ENERGY ANALYZER
KLEA and POWYS Series

Harmonic Management



Harmonics cause many problems for all sorts of equipment connected to the low voltage network. Before take the cost and and consequences of poor power quality, harmonics must be measured instantaneously and isolated from the source when it is necessary.

ENERGY ANALYZER
KLEA and POWYS Series

Fan Control

Assigning temperature value as an alarm paramater allows you to control temperature in a cabinet and prevents equipments from overheating thanks to integrated temperature sensor.

ENERGY ANALYZER
KLEA 3xxx Series

Data and Event Logging

Minimum, maximum and average values of measurements and consumption data are stored in non-volatile memory as hourly, daily and monthly. Plus, 50 alarm logs with time stamp allows you to analyze the malfunctions which were occured in the past.

ENERGY ANALYZER
KLEA 3xxx Series

Equipment Status Management

The status of a circuit breaker or a disconnector in an electrical power distrubution center can be monitored by means of digital inputs. According to digital input status(open or short circuit), simple Logic-0 or Logic-1 signal is sent to the PC through the modbus communication instantaneously.

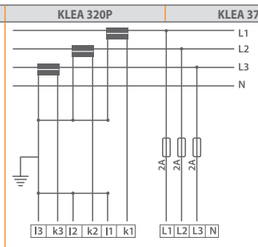
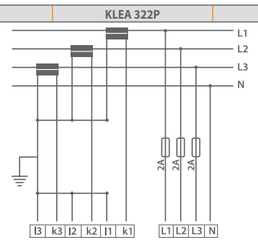
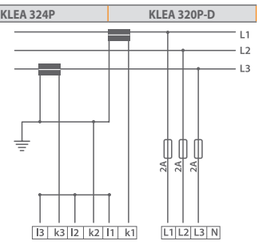
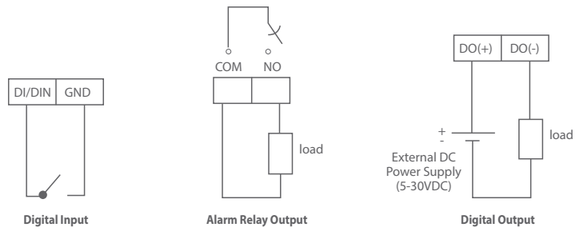
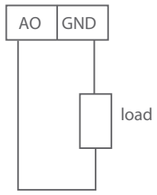
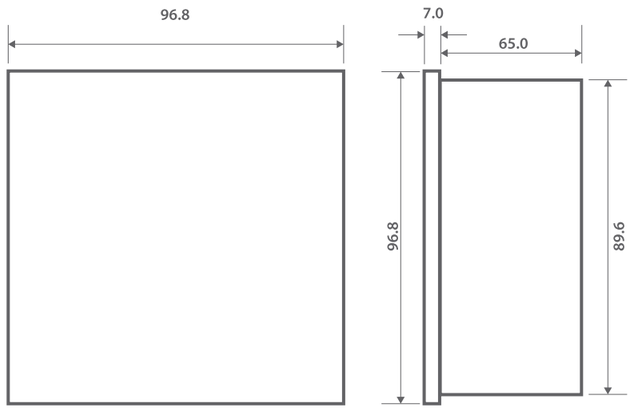
ANALYZER / MULTIMETER
KLEA and POWYS Series

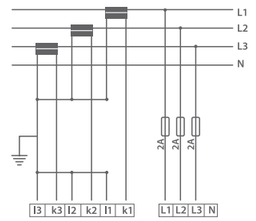
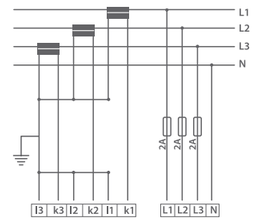
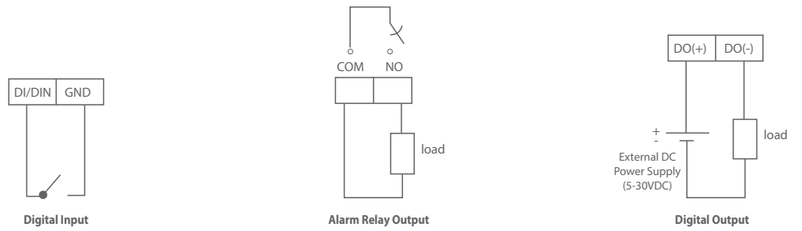
								
Type			**KLEA 320P**	**KLEA 370P**	**KLEA 322P**	**KLEA 324P**	**KLEA 320P-D**	
Definiton			3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	3Ø Energy Analyzer	
Order Number			606100	606101	606102	606103	606130	
General	Seven Segment Display		-	-	-	-	-	
	LCD		Available	Available	Available	Available	Available	
	Language Support		Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	Turkish, English, Russian	
	Battery		Available	Available	Available	Available	Available	
	Real Time Clock		Available	Available	Available	Available	Available	
	Password Protection		Available	Available	Available	Available	Available	
	Current Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	
	Voltage Transformer Ratio		1-5000	1-5000	1-5000	1-5000	1-5000	
	Demand Period		1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	
	Connection Type		3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	
	Measurement in Quadrants		4	4	4	4	4	
	Number of Measurement in a period		512	512	512	512	512	
	LCD/Display Refresh Period		1 sec	1 sec	1 sec	1 sec	1 sec	
	Networks		TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	
	Phasor Diagram		Available	Available	Available	Available	Available	
	Signal Waveforms		Available	Available	Available	Available	Available	
	Min/Max/Demand Values		Available	Available	Available	Available	Available	
Energy Measurement	Number of Tariffs		2	2	2	2	2	
	Multi Sub-Tariffs(Peak, Day and Off-Peak)		Available	Available	Available	Available	Available	
	1Ø Phase Energy Meters		Available	Available	Available	Available	Available	
	3Ø Phase Energy Meters		Available	Available	Available	Available	Available	
	4-Quadrant Reactive Energy Meters		-	-	-	-	Available	
Current Measurement Input	Measurement Range		10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
	Overvoltage Category		300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	
	Measurement Surge Voltage		2 kV	2 kV	2 kV	2 kV	2 kV	
	Power Consumption		<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
	intermittent overload		100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	
Voltage Measurement Input	Overvoltage Category		300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	
	Measured Range L-N		1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	
	Measured Range L-L		2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	
	Measured Frequency Range		45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	45-65 Hz	
	Power Consumption		<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	
	Sampling Freq.between 45-65 Hz		25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	25,6 kHz	
Power Quality Measurements	Harmonics for current and voltage phases		Upto 51st	Upto 51st	Upto 51st	Upto 51st	Upto 51st	
	THD-Voltage in %		Available	Available	Available	Available	Available	
	THD-Current in %		Available	Available	Available	Available	Available	
Other Measurements	Run Hour (Operating time for load in hours)		Available	Available	Available	Available	Available	
	On Hour (Operating time for meter in hours)		Available	Available	Available	Available	Available	
	Int Counter (Number of power interruptions)		Available	Available	Available	Available	Available	
Measurement Accuracy	According to IEC 61557-12	Total Active Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Total Reactive Power	Class 1	Class 1	Class 1	Class 1	Class 1	
		Total Apparent Power	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Total Active Energy	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	
		Frequency	Class 0.05	Class 0.05	Class 0.05	Class 0.05	Class 0.05	
		Current	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Neutral Current (calculated)	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		Voltage	Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
		Power factor	Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
		THDV, THDI	Class 1	Class 1	Class 1	Class 1	Class 1	
	According to IEC 62053-22	Total Active Energy	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	Class 0.2S	
	Accoding to IEC 62053-23	Total Reactive Energy	Class 2	Class 2	Class 2	Class 2	Class 2	
Inputs and Outputs	Alarm Relay Outputs	Number of outputs	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	
		Type	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	
		Max. Switching Current	10 A	10 A	10 A	10 A	10 A	
		Max. Switching Voltage	250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	
		Max. Switching Power	1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	

								
KLEA 370P-D			**KLEA 220P**	**KLEA 110P**	**KLEA-370P-VSM**	**KLEA-320P-DC**	**KLEA-220P-DC**	
3Ø Energy Analyzer			3Ø Energy Analyzer	3Ø Energy Analyzer		3Ø Energy Analyzer	3Ø Energy Analyzer	
606131			606160	606180	606121	606150	606190	
-			-	Available	-	-	-	
Available			Available	-	Available	Available	Available	
Turkish, English, Russian			-	-	Turkish, English, Russian	Turkish, English, Russian	-	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
1-5000			1-5000	1-5000	1 - 5.000	1 - 5.000	1 - 5.000	
1-5000			1-5000	1-5000	1 - 5.000	1 - 5.000	1 - 5.000	
1-60 minutes adjustable			1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	1-60 minutes adjustable	
3P4W, 3P3W, Aron			3P4W, 3P3W	3P4W, 3P3W	3P4W, 3P3W, Aron	3P4W, 3P3W, Aron	3P4W, 3P3W	
4			4	4	4	4	4	
512			256	256	512	512	256	
1 sec			1 sec	1 sec	1 sec	1 sec	1 sec	
TT, TN, IT			TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	TT, TN, IT	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
2			2	2	2 + 7 different energy meters	2	2	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			Available	Available	Available	Available	Available	
Available			-	-	-	-	-	
10mA-6A AC			10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	10mA-6A AC	
300 V Cat II			300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	300 V Cat II	
2 kV			2 kV	2 kV	2 kV	2 kV	2 kV	
<0.2 VA			<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	<0.2 VA	
100A for 1 sec			100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	100A for 1 sec	
25,6 kHz			12,8 kHz	12,8 kHz	25,6 kHz	25,6 kHz	12,8 kHz	
300 V Cat III			300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	300 V Cat III	
1-300 Vrms			1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	1-300 Vrms	
2-500 Vrms			2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	2-500 Vrms	
45-65 Hz			45-65 Hz	45-65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	
<0.1 VA			<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	<0.1 VA	
25,6 kHz			12,8 kHz	12,8 kHz	25,6 kHz	25,6 kHz	12,8 kHz	
Upto 51st			Upto 31st	Upto 31st	Upto 51st	Upto 51st	Upto 31st	
Available			Available	Available	Available	Available	Available	
Available			Available	Available	Available	Available	Available	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Available			-	-	Available	Available	-	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 1			Class 1	Class 1	Class 1	Class 1	Class 1	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 2			Class 2	Class 2	Class 2	Class 2	Class 2	
Class 0.05			Class 0.1	Class 0.1	Class 0.05	Class 0.05	Class 0.1	
Class 0.2			Class 0.5	Class 0.5	Class 0.2	Class 0.2	Class 0.5	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 0.2			Class 0.2	Class 0.2	Class 0.2	Class 0.2	Class 0.2	
Class 0.5			Class 0.5	Class 0.5	Class 0.5	Class 0.5	Class 0.5	
Class 1			Class 1	Class 1	Class 1	Class 1	Class 1	
Class 0.2S			Class 0.5S	Class 0.5S	Class 0.2S	Class 0.2S	Class 0.5S	
Class 2			Class 2	Class 2	Class 2	Class 2	Class 2	
2 pcs.			2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	
NO (SPST)			NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	NO (SPST)	
10 A			10 A	10 A	10 A	10 A	10 A	
250 VAC			250 VAC	250 VAC	250 VAC	250 VAC	250 VAC	
1250 VA			1250 VA	1250 VA	1250 VA	1250 VA	1250 VA	

Type			KLEA 320P	KLEA 370P	KLEA 322P	KLEA 324P	KLEA 320P-D
Inputs and Outputs	Digital Inputs	Number of inputs	2 pcs.	7 pcs.	2 pcs.	2 pcs.	2 pcs.
		Frequency	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms
		Input Present or Not	Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact
		Isolation Level	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
	Digital Outputs	Number of outputs	2 pcs.	7 pcs.	2 pcs.	2 pcs.	2 pcs.
		Switching Voltage Range	Transistor	Transistor	Transistor	Transistor	Transistor
		Frequency	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC
		Isolation Level	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms
		Number of outputs	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
	Analog Outputs	Range of Outputs 0-5 V, 0-10 V, -5-5 V, -10-10V, 0-20 mA, 4-20 mA	-	-	2	4	-
		Isolation	-	-	Available	Available	-
Supply	Voltage	AC	85-300V	85-300V	85-300V	85-300V	85-300V
		DC	85-300V	85-300V	85-300V	85-300V	85-300V
	Consumption	AC	< 3VA	< 3VA	< 3VA	< 3VA	< 3VA
		DC	<2.5W	<2.5W	<2.5W	<2.5W	<2.5W
	Frequency		45-65Hz	45-65Hz	45-65Hz	45-65Hz	45-65Hz
Data Logging with timestamp	Min/max/avg Values	Hourly records	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters
		Daily records	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters	240 days x 68 different paramaters
		Monthly records	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters	36 months x 68 different parameters
	Demand		4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters	4 months x 16 different parameters
	Alarm records		50	50	50	50	50
Communication	Protocol		Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU
	Baud rate		2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable
	Parity number		None	None	None	None	None
	Stop bit		1	1	1	1	1
	Address		1-247	1-247	1-247	1-247	1-247
	Isolation		2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS
Mechanical Properties	Weight(g)		404	428	428	428	404
	Protection Class		Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
	Assembly Type		Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
Cable Cross Sections	Supply, Voltage, Current, Relay Outputs	Stranded	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG
		Solid	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG
	Digital I/O, RS 485, Analog Output	Stranded	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG
		Solid	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG
Ambient Conditions	Operating Temperature		-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
	Storage Temperature		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C
	Relative Humidity (no condensation)		Max.95%	Max.95%	Max.95%	Max.95%	Max.95%

KLEA 370P-D	KLEA 220P	KLEA 110P	KLEA-370P-VSM	KLEA-320P-DC	KLEA-220P-DC
2 pcs.	2 pcs.	1 pc.	7 pcs.	2 pcs.	2 pcs.
100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms	100 Hz, 10 ms
Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact	Dry Contact
5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms	5000 Vrms
2 pcs.	2 pcs.	2 pcs.	7 pcs.	2 pcs.	2 pcs.
Transistor	Transistor	Transistor	Transistor	Transistor	Transistor
5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC	5-30 VDC
20 Hz, 50 ms	20 Hz, 50 ms	20 Hz, 50 ms	5000 Vrms	5000 Vrms	5000 Vrms
5000 Vrms	5000 Vrms	5000 Vrms	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
85-300V	85-300V	85-300V	85-300V	-	-
85-300V	85-300V	85-300V	85-300V	18-60VDC	18-60VDC
< 3VA	<4.5VA	<6VA	< 3VA	-	-
<2.5W	<2W	<3W	<2.5W	<2.5W	<2.2W
45-65Hz	45-65Hz	45-65Hz	45-65Hz	-	-
1920 hours x 68 different paramaters	-	-	1920 hours x 68 different paramaters	1920 hours x 68 different paramaters	-
240 days x 68 different paramaters	-	-	240 days x 68 different paramaters	240 days x 68 different paramaters	-
36 months x 68 different parameters	-	-	36 months x 68 different parameters	36 months x 68 different parameters	-
4 months x 16 different parameters	-	-	4 months x 16 different parameters	4 months x 16 different parameters	-
50	-	-	50	50	-
Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU	Modbus RTU
2400-115200 bps adjustable	1200-57600 bps adjustable	1200-57600 bps adjustable	2400-115200 bps adjustable	2400-115200 bps adjustable	1200-57600 bps adjustable
None	Odd, Even, None	Odd, Even, None	Odd,Even,None	Odd,Even,None	Odd,Even,None
1	1	1	1	1	1
1-247	1-247	1-247	1-247	1-247	1-247
2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS	2750V RMS
428	378	323	428	428	378
Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)	Front IP40 / Rear IP20 (IP66 with accessory)
Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount	Panel Mount
2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2,5 mm2 - 14AWG	2.5mm^2 - 14AWG	2.5mm^2 - 14AWG	2.5mm^2 - 14AWG
4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm2-12 AWG, 2x1.5 mm2-2x16 AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG	4mm^2 - 12AWG, 2x1.5mm^2 - 2x16AWG
1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG	1,5 mm2-16AWG
1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG	1.5 mm2-16 AWG, 2x0.75 mm2-2x18 AWG
-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C	-20 to +70 °C
-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30°C +80°C	-30°C +80°C	-30°C +80°C
Max.95%	Max.95%	Max.95%	Maks. 95%	Maks. 95%	Maks. 95%

Type		KLEA 320P	KLEA 370P	KLEA 322P	KLEA 324P	KLEA 320P-D
Schematics	Network Connections	 **3 wires with 3 CTs**	 **4 wires with 3 CTs**		 **3 wires with 2 CTs**	
		NOTE : CTs can be connected any phase for 3 wires with 2 CTs connection. They are connected to phase 1 and phase 3 in above figure.				
	Digital I/O And Alarm Output Connections	 **Digital Input** **Alarm Relay Output** **Digital Output**				
	Analog Output Connection	-				-
Dimensional Drawings						

KLEA 370P-D	KLEA 220P	KLEA 110P	KLEA-370P-VSM	KLEA-320P-DC	KLEA-220P-DC
	 **3 wires with 3 CTs**		 **4 wires with 3 CTs**		
 **Digital Input** **Alarm Relay Output** **Digital Output**					
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