KLEA Energy Analyzer
- Modular design
- No connector cables
- No fixing screws
- State of the art technology

Easy mounting on panels
connection to system
Data Collection Platform

- All forms of energy can be collected by one KLEA.
- 2 Digital I/O is standard in KLEA.
- Plus 5 I/O is optional.
- User can collect data from gas, water and/or pressure meters.
- Production quantity can be collected by a limit switch or a dry contact coming from a proximity sensor.
- User can calculate total consumption of all forms of energy and calculate energy cost per product.

Dual Source Energy Measurement

- Generators produce much more expensive energy compared to utility supply.
- Klea has generator input and it is activated once generator is on.
- Users can set Tariff 2 to measure genset usage as a power supply and this brings users to identify the exact cost of the energy.
Multi-Tariff Energy Measurement

- In addition to Tariff 2, Tariff 1 is split into three with adjustable start & end times for each sub-tariff.
- User can use these sub-tariffs in order to measure energy consumption for different shifts in a facility.
- Tariff 1-1, 1-2 and 1-3 values are also saved in non-volatile memory. User can read these values from the screen remotely Modbus communication.

Demand Management

- User can adjust demand period between 1 to 60 minutes.
- Klea keeps demand for I, P, Q, and S for each phase.
- Klea monitors P, Q, S and I values and gets the average values of 4 parameters for each demand period.
- Klea logs the maximum value of the average values in a month.
- Klea keeps 4 months demand logs for 4 parameters with time stamp.
- P, Q, S and I values are measured for each phase and sum.

Data Logging

- Klea measures 68 different energy parameters.
- Klea logs 80 days hourly
  240 days daily
  36 months monthly real time measurements of 68 parameters.
- Klea logs 4 months demand values.
- Klea logs 50 recent alarms with time stamp.
- 1 MB Memory
Surge Withstand 100 A/1 sec

Klea current inputs can withstand surges up to 100 A for 1 second.

In medium voltage applications, current transformers may generate peak currents in secondary windings. These peak values may reach up to 100 A and as a result of this current inputs of the analyzer may burn out and create an open circuit for secondary connections of the CT.

This may result in an explosion on CT since secondary side is open circuited.

Signal Waveform Monitoring

- Klea’s high sampling rate enables the user to monitor a real-time signal waveform.
- Klea’s sampling rate per period is 512.
- User can monitor the effects of harmonics on the system from this screen.

Programmable Analog Outputs

- Klea can be used as an energy transducer in substation automation projects.
- Some models have either 2 or 4 programmable analog outputs and user can set any measured parameter to be disclosed with any of the output channel.
# Accuracy Class (0.2s)

<table>
<thead>
<tr>
<th>Function Symbol</th>
<th>Function</th>
<th>Function Performance Class According to IEC 61557-12</th>
<th>Measuring Range</th>
<th>Other Complementary Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Total active power</td>
<td>0.2</td>
<td>10 % (I_b \leq I \leq I_{max}) 0.5 Ind to 0.8 Cap</td>
<td>-</td>
</tr>
<tr>
<td>Q_v</td>
<td>Total reactive power</td>
<td>1</td>
<td>5 % (I_b \leq I \leq I_{max}) 0.25 Ind to 0.25 Cap</td>
<td>-</td>
</tr>
<tr>
<td>S_e</td>
<td>Total apparent power</td>
<td>0.2</td>
<td>10 % (I_b \leq I \leq I_{max}) 0.5 Ind to 0.8 Cap</td>
<td>-</td>
</tr>
<tr>
<td>E_a</td>
<td>Total active energy</td>
<td>0.2</td>
<td>0 to 49999999999</td>
<td>IEC 62053-22 Class 0.2S</td>
</tr>
<tr>
<td>E_re</td>
<td>Total reactive energy</td>
<td>2</td>
<td>0 to 49999999999</td>
<td>IEC 62053-23 Class 2</td>
</tr>
<tr>
<td>f</td>
<td>Frequency</td>
<td>0.05</td>
<td>45 - 65 Hz</td>
<td>-</td>
</tr>
<tr>
<td>I</td>
<td>Phase current</td>
<td>0.2</td>
<td>20 % (I_b \leq I \leq I_{max})</td>
<td>-</td>
</tr>
<tr>
<td>I_{nc}</td>
<td>Neutral current</td>
<td>0.5</td>
<td>20 % (I_b \leq I \leq I_{max})</td>
<td>-</td>
</tr>
<tr>
<td>U</td>
<td>Voltage</td>
<td>0.2</td>
<td>(U_{min} \leq U \leq U_{max})</td>
<td>-</td>
</tr>
<tr>
<td>P_{fa}</td>
<td>Power factor</td>
<td>0.5</td>
<td>0.5 Ind to 0.8 Cap</td>
<td>-</td>
</tr>
<tr>
<td>THDV</td>
<td>Total harmonic distortion voltage</td>
<td>1</td>
<td>0 % to 20 %</td>
<td>-</td>
</tr>
<tr>
<td>THDI</td>
<td>Total harmonic distortion current</td>
<td>1</td>
<td>0 % to 100 %</td>
<td>-</td>
</tr>
</tbody>
</table>

### Other Features

- Graphical LCD
- Language Support
- Harmonics Measurement upto 51
- Advanced Alarm Settings
- Real Time Clock
### General

**Graphical LCD:** 6 buttons

**Password Protection:** -

**Supply Voltage AC:** 85–300 V AC

**Supply Voltage DC:** 85–300 V DC

**Current Transformer Ratio:** 1–5000 A

**Voltage Transformer Ratio:** 1–5000 A

**Connection Type:** 3P4W, 3P5W Aron

**Measurement in Quadrants:** 4

**Networks:** TT, TN, IT

**Accuracy Class Voltage:** 0.2

**Accuracy Class Current:** 0.2

**Accuracy Class Active Energy:** 0.5

**Number of Measurement in a period:** 512

**Power Consumption:** < 3 VA

### Power Quality Measurements

<table>
<thead>
<tr>
<th>Harmonics / current and voltage</th>
<th>Up to 51st</th>
<th>Up to 51st</th>
<th>Up to 51st</th>
<th>Up to 51st</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD-Voltage in %</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>THD-Current in %</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phasor Diagram</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Data Logging

- Average, Minimum, Maximum Values
- Alarms
- Time Stamps
- Demand

### Voltage Measurement Input

- **Overvoltage Category:** 300 V Cat II
- **Measured Range U-N:** 1–300 Vrms
- **Measured Range U-L:** 2–500 Vrms
- **Measured Frequency Range:** 45–65 Hz
- **Power Consumption:** < 0.1 VA
- **Sampling Frequency between 45–65 Hz:** 25 kHz

### Current Measurement Input

- **Ramp Current:** 6 A
- **Overvoltage Category:** 300 V Cat II
- **Measured Surge Voltage:** 2 kV
- **Power Consumption:** < 0.2 VA
- **Peak current for 1 sec:** 100 A
- **Sampling Frequency between 45–65 Hz:** 25.6 kHz

### Input Outputs

- **Relay Outputs:** 2
- **Max. Switching Current:** 10 A
- **Max. Switching Voltage:** 250 VAC
- **Max. Switching Power:** 1250 VA
- **Minimum Counting Frequency:** 100 Hz, 10 ms
- **Input Present or Not:** Dry Contact

### Mechanical Properties

- **Weight:** 0.404 kg
- **Protection Class:** IP 40 front, IP 20 rear
- **Assembly Type:** Panel Mount
- **Dimensions:** W96 x H96 x D72

### Cable Cross Sections

<table>
<thead>
<tr>
<th>Standard</th>
<th>Cables</th>
<th>Solid</th>
<th>Stranded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4mm² - 12 AWG</td>
<td>2.5 mm² - 14 AWG</td>
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<td>4mm² - 12 AWG</td>
<td>2.5 mm² - 14 AWG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2x1.5 mm² - 2x16 AWG</td>
<td>2x1.5 mm² - 2x16 AWG</td>
</tr>
</tbody>
</table>

### Ambient Conditions

- **Operating Temperature:** -20 °C – +60 °C
- **Storage Temperature:** -30 °C – +80 °C
- **Relative Humidity (no condensation):** 95%

### Communication and Others

- **Modbus RTU:** -
- **Battery:** -
- **Heat Time Clock:** -

### Standards in Compliance

- **Safety requirements for electrical equipment:** IEC 61010-1
- **Electrostatic discharge immunity test:** EN 61000-4-2
- **Radiated, radio-frequency electromagnetic field immunity test:** EN 61000-4-3
- **Immunity to conducted disturbances:** EN 61000-4-6
- **Power frequency magnetic field immunity test:** EN 61000-4-8
- **Voltage dips, short interruptions and voltage variations immunity tests:** EN 61000-4-11

### Disturbance characteristics - Limits and methods of measurement

- **Industrial, scientific and medical equipment - Radi frequency:** EN 55011/A1:2010
- **Disturbance characteristics - Limits and methods of measurement:** EN 55011/A1:2010
**Dimensions (mm)**

- 3 Phase Connection With Neutral (3P4W)
- 3 Phase Connection No Neutral (3P3W)

**Wiring Diagrams**

- 3 Phase No Neutral Aron Connection