

# ENERGY MEASUREMENT



## POWER ANALYZER

Power Analyzer is able to measure and monitor currents of 3 phases, phase-neutral and phase-phase voltages, frequency, active and reactive powers, apparent powers, Cos  $\phi$  and power factor values. In addition, it records active and reactive energy consumptions.

The demand and peak values for those measured quantities can be monitored via the analyzer.

Many settings (Current Transformer, Voltage Transformer etc.) related to the device can be made through the menu screens.

In the models with communication property, all read parameters can be monitored remotely via standard Modbus protocol and various adjustments can be made.

In the models which have relay output feature, relay outputs can be managed according to many different parameters (Current, Voltage, Active and Reactive Power, Cos  $\phi$ , PF etc.) which set through device menu.

## MULTIMETER

The multimeter measures and calculates the current and the voltage values that belong to 3 phases as True RMS. It also measures the frequency and displays these quantities and measurement values on the screen. It can optionally measure neutral-to-earth voltage and displays the values on the screen.

The current transformer and the voltage transformer settings can be made via the menu.

In the versions which have output feature, the relay is controlled according to the current and the voltage value ranges that set via the menu.

Multimeter does not require a separate supply input with its new supply design. The device operates if there is energy in one of the voltage inputs (85-265 Volt).

## VOLTMETER

To measure and continuously monitor AC voltage values of three phases are devices produced for the purpose. It is connected in parallel to the circuit.

## TECHNICAL FEATURES

### POWER ANALYZER / MULTIMETER

- Operating Voltage: 230 V AC
- Operating Voltage Range: (0.8-1.1)xIN
- Operating Frequency: 50Hz
- Measuring Power Consumption < 1 VA.
- Voltage Measurement Range:  
(Phase-Neutral) 10-280 V AC, 45-55 Hz.  
(Phase-Phase) 10-480 V AC, 45-55 Hz.
- Class: 1%  $\pm$  1 digit.
- Protection Class (Multimeter): IP20.
- Protection Class (Power Analyzer): IP40.
- Current Transformer Ratio: 5/5....10.000/5
- Indicator: Red LED Display.

## AMPERMETER

The device is produced to measure and monitor the AC current drawn by the loads. It connects to the circuit as series.

## KEY FEATURES

### POWER ANALYZER

- 85-265 Volt (Universal) supply
- 3 pieces 4 digit 7 feed display
- 3 Phase Current Input
- Phase Voltage Input
- 2 Relay Outputs (Optional)
- RS485 Communication (Optional)

### MULTIMETER

- 85-265 Volt (Universal) supply
- 3 pieces 4 digit 7 feed display
- 3 Phase Current Input
- Phase Voltage Input
- 2 Relay Outputs (Optional)
- 1 Earth Voltage Input (Optional)

# POWER ANALYZER

## KEY FEATURES



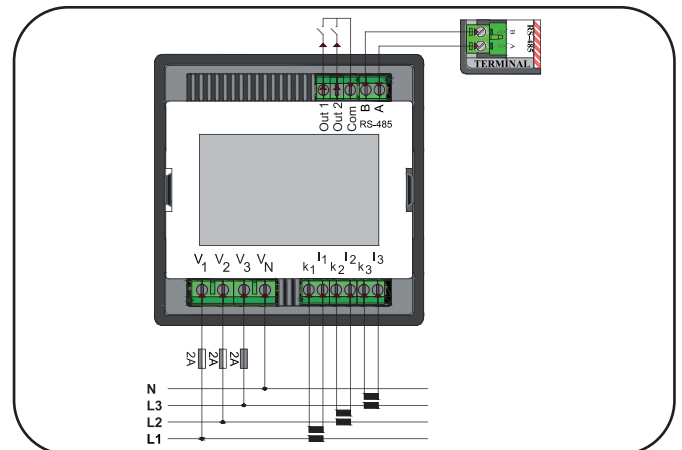
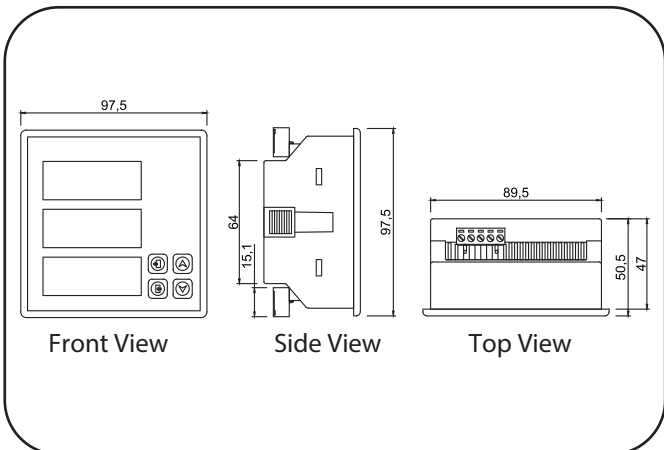
- Microprocessor based.
- Phase-to-phase, line voltage: 190 - 36.200 V
- Current transformer ratio: 5/5 - 10.0000/5 A.
- Energy values are periodically recorded in the permanent memory, even if the power is cut off, the device continues to record energy values from where it left off when the device is turned on again.
- Optionally, it has 2 pieces 5 A relay outputs.
- Communication protocol: Standard Modbus-RTU.
- Supports RS-485 connection.
- Compatible with CT 30 type current transformer.
- Power consumption is less than 10.5 VA for relay output model and less than 9 VA for normal model.
- Power consumption of measuring inputs < 1 VA.
- Voltage measuring range phase-neutral: 10-280 V AC, 45-55 Hz, phase-phase; 10-480 V AC, 45-55 Hz.
- Minimum measurement values: 2 mA 10 V.
- Measurement accuracy: 1%.
- It periodically saves the peak values of all parameters in its memory.
- Energy, demand and peak values of all parameters can be classified from the menu.

## TECHNICAL FEATURES

Product Code	Product Name	CT 30	3*V <sub>LN</sub> /3*V <sub>L-L</sub>	3*H	X/5 A	Active Power (W)	Reactive Power (kVAr)	Visible Power	Total W	Total (kVAr)	Total VA	Imp/Exp of Active Energy	Imp/Exp of Reactive Energy	Demand	RS-485/Modbus	Cosφ	Tanφ	Power Factor (PF)	Frequencies	Average Inductive and Capacitive Ratios	Voltage-Current-Frequency/Averages	Output Control (2 pieces)	Screen Segment
GA4111	POWER ANALYZER		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
GA4112	POWER ANALYZER (CT30)	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
GA4113	COMMUNICATION POWER ANALYZER		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
GA4114	COMMUNICATION POWER ANALYZER (CT30)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
GA4115	POWER ANALYZER W/RELAY OUTPUT & COMM.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
GA4116	POWER ANALYZER W/RELAY OUTPUT & COMM. (CT30 AT)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

## CONNECTION DIAGRAM

## TECHNICAL DRAWING



# RAIL TYPE POWER ANALYZER

## KEY FEATURES

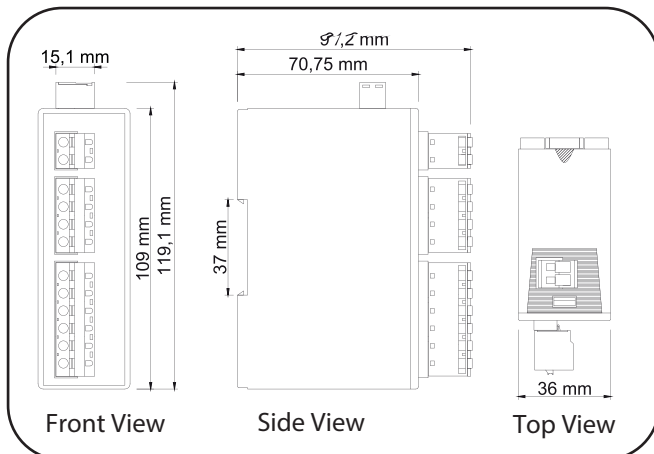
- Microprocessor based.
- Phase-to-phase, line voltage: 190 - 36.200 V.
- Current transformer ratio: 5/5 - 10.000/5 A.
- Energy values are periodically saved in the permanent memory, even if the power is cut off, the device continues to lose energy values from where it left off when it is turned on again.
- Suitable for in-panel rail mounting.
- Communication protocol: Standard Modbus-RTU.
- Supports RS-485 connection.
- Compatible with CT 30 type current transformer.
- It has 3 different modes as automatic, manual and reverse to adjust the polarity direction of current transformers.
- It has LEDs indicating power, RS-485, L1-L2-L3 and error status.
- Operating Voltage: 180 - 230 V AC.
- Power consumption < 2.5 VA.
- Power consumption of measuring inputs < 1 VA.
- Voltage measuring range phase-neutral: 10-280 V AC, 45-55 Hz, phase-phase; 10-485 V AC, 45-55 Hz.
- Minimum measurement values: 2 mA 10 V.
- Measurement accuracy: 1%.
- It periodically saves the demand values in its permanent memory. Demand values are not lost when the power is cut off.
- It periodically saves the peak values of all parameters in the memory.



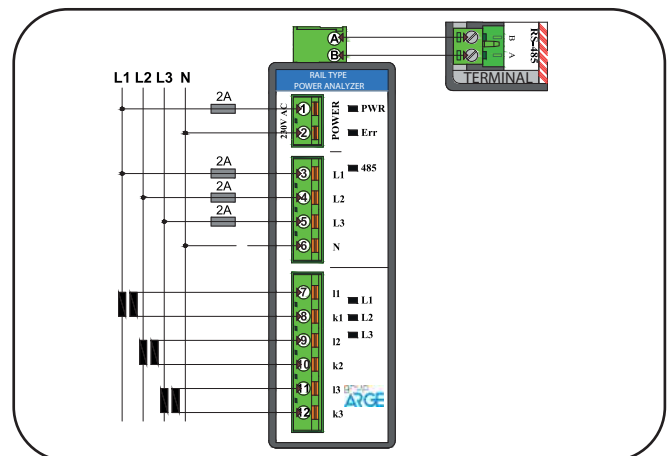
## TECHNICAL FEATURES

Product Code	Product Name	Size	Technical Features																				
			CT 30	3*V <sub>LN</sub> /3*V <sub>L-L</sub>	3*I	x5 A	Active Power (W)	Reactive Power (kVar)	Visible Power	Total W	Total (kVA)	Total VA	Imp/Exp of Active Energy	Imp/Exp of Reactive Energy	Demand	RS-485/Modbus	Cosφ	Tanφ	Power Factor (PF)	Frequencies	Average Inductive and Capacitive Ratios	Voltage-Current-Frequency Averages	Peak Value
GA4131	RAIL TYPE POWER ANALYZER	35x108	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GA4132	RAIL TYPE POWER ANALYZER (CT30 AT)	35x108	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## TECHNICAL DRAWING



## CONNECTION DIAGRAM



# MULTIMETER

## KEY FEATURES

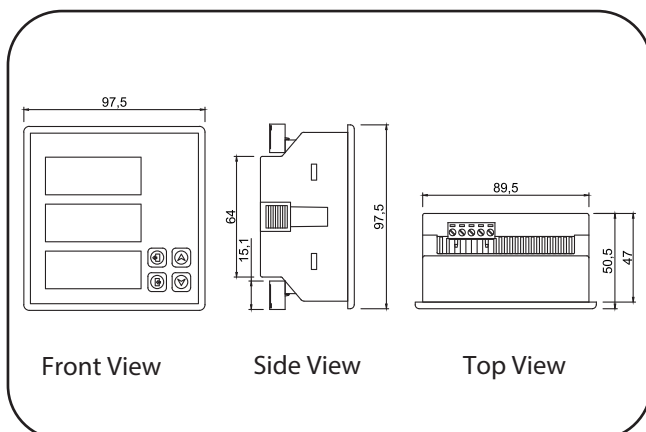
- Microprocessor based.
- It can measure phase-phase and phase-neutral voltages, current and frequency of three phases.
- Phase-to-phase, line voltage: 190 - 36.200 V.
- Current transformer ratio 5/5 - 10.000/5 A.
- Optionally has 2 pieces 5 A relay outputs.
- Compatible with CT 30 type current transformer.
- It has 3 different modes as automatic, manual and reverse to adjust the polarity direction of current transformers.
- Operating voltage: 85 - 265 V AC.
- Operating frequency: 45-65 Hz.
- Power consumption is less than 8.5 VA in the relay output model and less than 7 VA in the normal model.
- Power consumption of measuring inputs < 1 VA.
- Voltage measuring range phase-neutral: 10-280 V AC, 45-65 Hz, phase-phase; 10-480 V AC, 45-65 Hz.
- Minimum measurement values: 25 mA 10 V.
- Measurement accuracy: -/+%1.
- Protection class: IP20.
- 3 pieces, 4 digits 7-segment display.
- Operating ambient temperature: -10°C - +55°C.



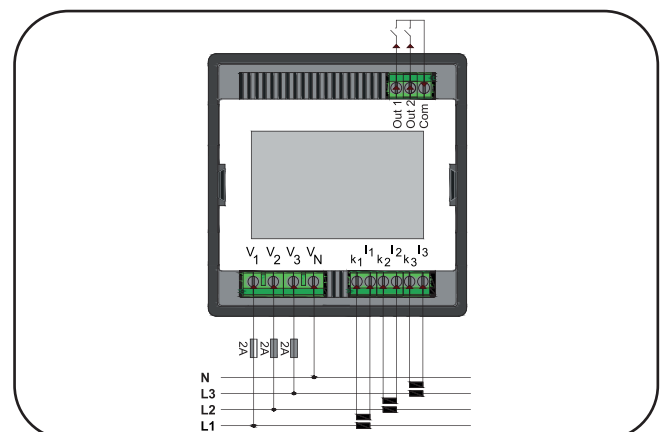
## TECHNICAL FEATURES

Product Code	Product Name	Product Description	CT30	X/5 A	3*V / 3*VL-L	3 * I	Neutral - Earth Voltage	85-265 V AC	Frequencies	Voltage-Current-Frequency averages	Output Control (2 pieces)	7 Segment Display
GA4211	MTM 11	MULTIMETER		✓	✓	✓		✓	✓	✓		✓
GA4212	MTM 12	MULTIMETER (CT30 AT)	✓		✓	✓		✓	✓	✓		✓
GA4213	MTM 13	RELAY OUTPUT MULTIMETER		✓	✓	✓	✓	✓	✓	✓	✓	✓
GA4214	MTM 14	RELAY OUTPUT MULTIMETER (CT30 AT)	✓		✓	✓	✓	✓	✓	✓	✓	✓

## TECHNICAL DRAWING



## CONNECTION DIAGRAM



# VOLTMETER

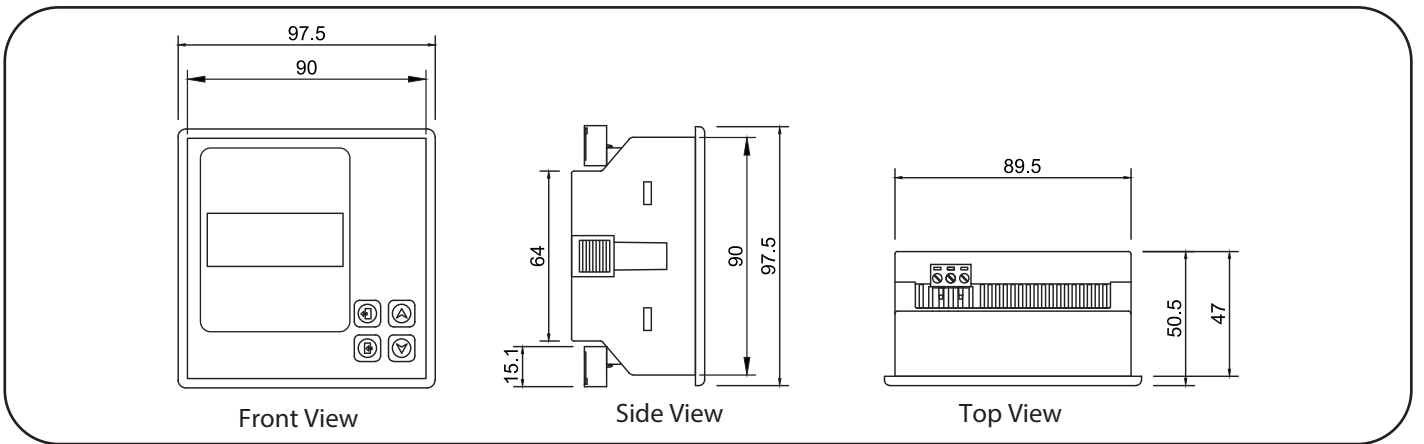
## KEY FEATURES



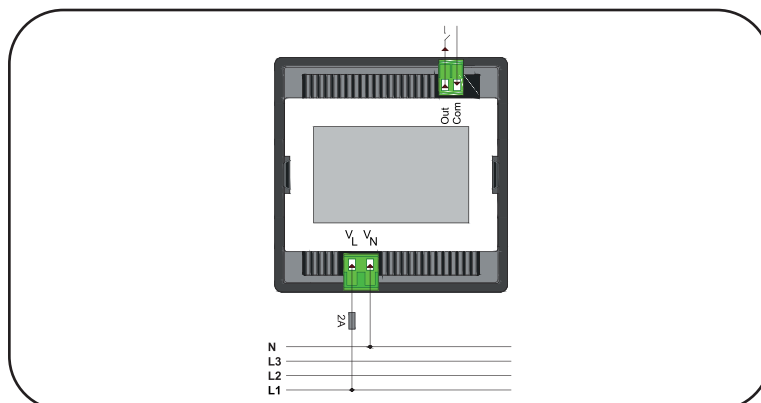
- Microprocessor based.
- It is capable of measuring the phase-neutral voltage of a phase.
- Optionally, it has 1 5 A relay output.
- Operating voltage: 85 - 265 V AC.
- Operating frequency: 45-65 Hz.
- Power consumption is less than 7 VA in the set model and less than 5 VA in the normal model.
- Power consumption of measuring inputs: < 1 VA.
- Voltage measuring range phase-neutral: 10-280 V AC, 45-65 Hz.
- Measurement accuracy: 1%.
- Protection class: IP20
- There is 1 4-digit 7-segment display.
- Operating ambient temperature: -10°C - +55°C.

## TECHNICAL FEATURES

Product Code	Product Name	Product Description	Screen	Four Digit	Panel Type	85-265 V AC	1 Phase Measurement	Set
GA4311	VTM 11	VOLTMETER	1	✓	✓	✓	✓	
GA4312	VTM 12	VOLTMETER WITH SET	1	✓	✓	✓	✓	✓



## CONNECTION DIAGRAM



# AMPERMETER

## KEY FEATURES

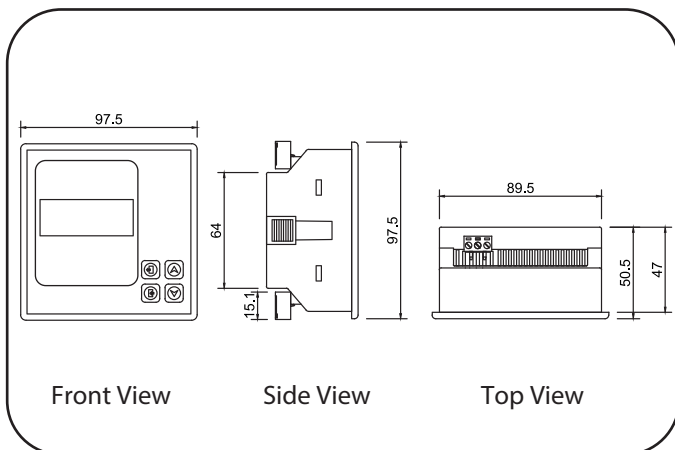


- Microprocessor based.
- It is capable of measuring the current of a phase. It is possible to enter separate input current limit values for X/5 A and CT 30 type current transformers.
- Current transformer ratio: 5/5 - 10.000/5 A.
- Optionally, it has 1 piece 5 A relay output.
- Compatible with CT 30 type current transformer.
- Operating voltage: 85 - 265 V AC.
- Operating frequency: 45-65 Hz.
- Power consumption is less than 7 VA in the set model and less than 5 VA in the normal model.
- Power consumption of measuring inputs: < 1 VA.
- Minimum measurement values : 25mA.
- Measurement accuracy: 1%.
- Protection class: IP20
- There is 1step 4-digit 7-segment display.
- Operating ambient temperature: -10°C - +55°C.

## TECHNICAL FEATURES

Product Code	Product Name	Product Description	x/5 A	CT 30	Panel Type	Screen	Four Digit	85-265 V AC	1 Phase Measurement	Set
GA4411	APM 11	AMPERMETER	✓		✓	1	✓	✓	✓	
GA4412	APM 12	AMPERMETER (CT30 AT)		✓	✓	1	✓	✓	✓	
GA4413	APM 13	AMPERMETER WITH SET	✓		✓	1	✓	✓	✓	✓
GA4414	APM 14	AMPERMETER WITH SET(CT30 AT)		✓	✓	1	✓	✓	✓	✓

## TECHNICAL DRAWING



## CONNECTION DIAGRAM

