



# Gopal Electronics

## TFT780

## 3 Phase Power Analyzer



### Key Features

Basic Accuracy 0.05% R+R  
Refresh rate : 250ms / 500ms / 1000ms  
Up to 64th Harmonics Measurement  
Wave form display Voltage & Current  
USB Connectivity + Free Software  
B/H Curve Mode

### Range

0 to 700 Voltage (P-N)  
80Amp. Direct Measurement  
CT-PT Ratio Scalable  
**8 Range of Voltage**  
**8 Range of Current**  
40Hz to 200Hz

- 7" Graphics Display
- 26 Keys
- Selectable display update rate
- 2MHz Sampling Rate

- Inbuilt DSO Function
- 1MB onboard Memory
- USB 2.0
- PH-PH, PH-N selection

- Most Accurate at Low PF
- Direct Panel Mountable design

## Scope of Measurement

Voltage True RMS  
Current RMS  
Power (Watt)  
Power Factor  
Frequency  
THD

Mean Voltage  
Mean Current  
Peak Voltage  
Peak Current  
DC Voltage  
Inside Temperature

Wave forms of voltage & Current  
Harmonics up to 64th Order  
Live B/H Curve

## Measurement Speed

- Accurate = 1 second display update time
- Fast - S1 = 1 second display update time
- Fast - S2 = 500ms display update time
- Fast - S3 = 250ms display update time



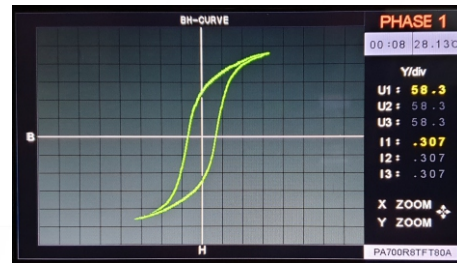
TFT780 series Power Analyzer has given revolution in testing of distribution and power transformer with the advanced feature of hysteresis (B/H) analysis. Core loss & winding loss measurement is important in transformer testing. In conventional method, power Analyzer used with digital oscilloscope and phase converter to calculate knee value and saturation point of core. TFT780 eliminate the requirement of multiple equipment and made the testing more easy by inbuilt hysteresis measurement mode. Which plot live hysteresis curve, so derivation of knee and saturation value is easy.

TFT780 is multi-range power Analyzer with basic 0.05% R+R accuracy. 8 range of voltage, 8 range of current and total 64 range of power and power factor gives more accurate result. The gap less four-quadrant power measurement technique gives better accuracy at distorted waveforms or AC drive (VFD) operated power supply.

Any distortion in line power directly reflect on the measurement, TFT780 has waveform display mode which gives  $d(y) / d(t)$  of line voltage and current. In addition, there is facility of zoom in and zoom out to get precise analysis.

TFT780 provides facility to selection speed of measurement by keypad. It play big role during setting test voltage and current in transformer testing. User can set fast speed mode during setting of test voltage and current and then accurate mode during fine measurement. It saves time in make testing easy.

### B/H Mode (Hysteresis curve)



### Wave form mode



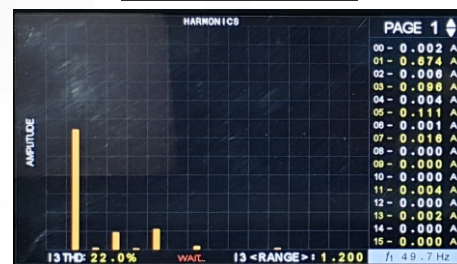
### Reading Mode system



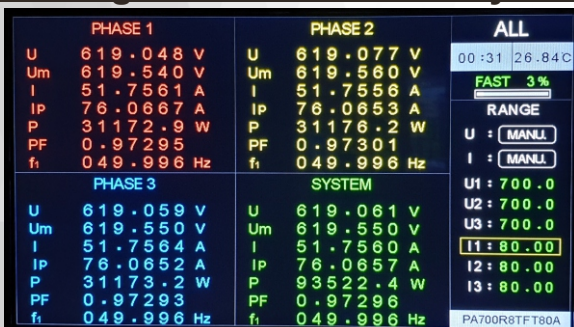
### Reading Mode Phase 1



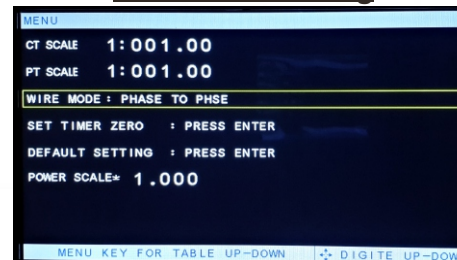
### Harmonics Mode



### Reading Mode All Phase & System



### CT/PT ratio setting



## Accuracy of Current

Range of current	Full Scale Value	Accuracy @ 50Hz ± (% Reading + % Range)	Resolution 5digit	Temperature co-efficient ± ppm
0.6A	.600000	0.05% R + 0.05% R	1 µA	100 ppm
1.2A	1.20000	0.05% R + 0.05% R	10 µA	100 ppm
2.5A	2.50000	0.05% R + 0.05% R	10 µA	100 ppm
5.0A	5.00000	0.05% R + 0.05% R	10 µA	100 ppm
10A	10.0000	0.05% R + 0.05% R	100 µA	100 ppm
20A	20.0000	0.05% R + 0.05% R	100 µA	100 ppm
40A	40.0000	0.05% R + 0.05% R	100 µA	100 ppm
80A	80.0000	0.05% R + 0.05% R	100 µA	100 ppm

## Accuracy of Voltage

Range of Voltage	Full Scale Value	Accuracy @ 50Hz ± (% Reading + % Range)	Resolution 5digit	Temperature co-efficient ± ppm
5V	5.00000	0.05% R + 0.05% R	10 µV	100 ppm
11V	11.0000	0.05% R + 0.05% R	100 µV	100 ppm
22V	22.0000	0.05% R + 0.05% R	100 µV	100 ppm
44V	44.0000	0.05% R + 0.05% R	100 µV	100 ppm
88V	88.0000	0.05% R + 0.05% R	100 µV	100 ppm
175V	175.000	0.05% R + 0.05% R	1 mV	100 ppm
350V	350.000	0.05% R + 0.05% R	1 mV	100 ppm
700V	700.000	0.05% R + 0.05% R	1 mV	100 ppm

## Accuracy of Power

Range of Power	Full Scale Value	Accuracy @ 1PF ± (% Reading + % Range)	Accuracy Lead, Lag 0.5PF ± (% Reading + % Range)	Accuracy Lead, Lag 0.1PF ± (% Reading + % Range)	Accuracy Lead, Lag 0.0PF ± (% Reading + % Range) % of VA
5V * 0.6A	3.00000	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
11V * 1.2A	13.2000	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
22V * 2.5A	55.0000	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
44V * 5.0A	220.000	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
88V * 10A	880.000	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
175V * 20A	3500.00	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
350V * 40A	14000.0	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5
700V * 80A	56000.0	0.08 + 0.08	0.1 + 0.1	0.5 + 0.5	0.5 + 0.5



## Harmonics & Frequency Specification

Harmonics	Specification / Accuracy Fundamental frequency 50Hz to 60Hz
Bandwidth	50Hz to 60Hz
Signal Processing	DFT ( Discreet Fourier Transform)
Sampling Frequency	8Khz
No. of Harmonics	64
THD Voltage	5%
THD Current	5%

Frequency	24Hours Accuracy of Frequency, Sine wave, when selected accurate mode, filters time 16 seconds, (Display update time 1 second), CalTemp = 25Co +- 10Co	
Range of Frequency	Full Scale Value	Accuracy± ( % of reading + % of range)
30Hz to 200Hz	200.00	0.01 + 0.01

## Specification

Warm up time	30 minutes (For specified accuracy)
Number of channels	3 Voltage , 3 Current
Maximum Direct Voltage Input	700V rms / 1000V peak
Voltage multiplier / PT scaling	0.01 to 500.00
Voltage Input Impedance	2.82 MΩ Phase to Neutral
Maximum Direct Current Input	80A rms / 113V peak
Current multiplier / CT scaling	0.01 to 500.00
Recommended CT	20VA to 100VA class 0.1
Power multiplier / Watt scaling	0.001 to 2.000
Operating Temperature	10 °C to 45 °C
Operating Humidity	20% to 75% RH (non condensation)
Storage temperature	-20 °C to 48 °C
Length x Width x Height	L= 330mm, W= 518mm, H= 183mm (± 2mm)
Length x Width x Height with fittings	L= 375mm, W= 567mm, H= 193mm (± 2mm)
Panel cut out size	L= 332mm, W= 520mm, H= 185mm (± 2mm)
Net Weight	6.6Kg without accessories (± 0.2Kg)
Weight with packing	9.5 Kg (± 0.2Kg)
Display type	TFT Colour Display
Measuring Terminals	Measuring Terminals 1/4" BSW for current, 4mm banana plug for voltage
Housing	Equipped with MS case to meet stringent EMC requirements.
Fitting hardware nut bolt screw	All screw nut bolt used stainless steel (silver finish)
Environmental	98% of total weight material recyclable

## Measuring system

TFT780 power analyzers accurately measure current and voltage and calculate power and calculate other derived, values from these high-precision measurements. Accuracy is not affected by either the waveform shape or frequency over a wide range. Phase shift accuracy is maintained due to the input channel design. Harmonics are calculated up to 64th on line frequency. The DSO function represents measured input parameters as waveforms. Voltage and current can be measured directly via the instrument's integrated voltage dividers and current transformer. It is also possible to connect external voltage dividers as well as current transformer or current probes for specific applications.

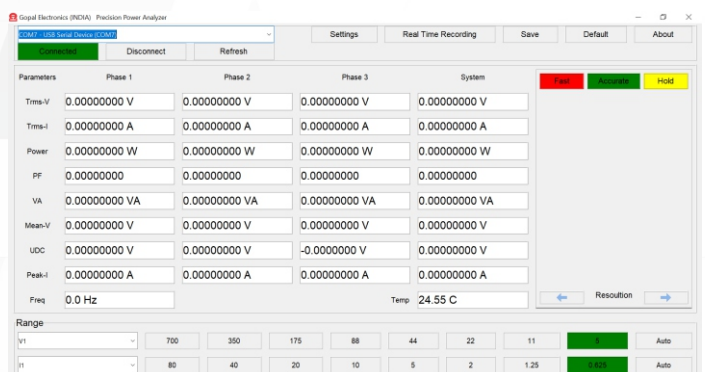
## Features

- Compact, high precision power analyzers – easy to carry and save working space.
- Simple user interface ensures easy, intuitive operation.
- Standard configurations allow users to specify the exact functionality required for their own unique application.
- 7 Inch graphics display
- All inputs are galvanically isolated to avoid short circuits in any type of applications.
- Harmonics up to the 64th order for Voltage and current
- Digital Oscilloscope (DSO) mode included.
- User-selectable average time – 250ms Fast 3%, 500ms Fast 2%, 1000 ms Fast 1%, 16S Accurate by single key for dynamic measurements.
- 1MB on-board memory for storage of measured values.
- Computer interface with USB 2.0 & PC software for data download, analysis
- 2 MHz sample rates for detailed signal analysis, With SINC + FIR digital filter give noise free measurement.
- Bandwidth from 40 Hz to 200 Hz for reliable measurement precision.

## Standards and Safety

- Electrical Safety EN 61010-1 / 2nd Edition 1000 V CAT II (600 V CAT III)
- Degree of pollution 2, safety Class I
- EN 61558 for transformer
- EN 61010-2-031/032 for accessories
- Maximum Inputs For voltage inputs Measurement range 700Veff, 1kV peak
- For current inputs Measurement range 80 Aeff, 100 Apeak
- Test Voltages Mains input to housing (earth ground connector): 2.5 KV ac
- Mains connection to measuring inputs: 4kV ac
- Measuring inputs to housing: 3.3 kV ac
- Electromagnetic compatibility Emission: IEC 61326-1, EN 50081-1, EN 55011 Class B
- Immunity: IEC 61326-1 / Annex A (industrial sector), EN 50082-15

## USB 2.0 + Software



- All Reading in single page
- Range selection in software
- CT / PT scale setting
- Real time recording
- Export test result to Excel

## About Us

Gopal Electronics was established in 1989 by Mr. Gangaram Panchal in Ahmedabad (India), who has over 40 years of experience in magnetic measurement of soft and hard magnetic material. He invented the first product that was the single sheet watt loss tester for watt loss measurement



of motor stamping and EI type laminations. That product proves as very good solutions for the trades and suppliers of electrical stamping to evaluate their material grade. We setup our new manufacturing unit at naroda, Ahmedabad in 1995. Then the development chain starts and we developed range of products like Digital Iron Loss Tester, Holiday Detector, 3

Phase Power Analyzer Epstein tester, Franklin Tester, Turns ratio meter etc. Our range of products is world renowned. These instruments are endorsed by reputed companies like ABB, BHEL, Tata Steel, Emco Ltd, Alstrom (Areva), Crompton Greaves (Germany) etc.



## Exporting to More than 45 Countries



## Few of our Valued Customers

Tata Steel  
Essar Steel  
Ajanta Group  
Orient Electric  
Arev T&D  
BHEL  
Pitti Lamination  
ABB  
Crompton Greaves

Jindal's  
Orpat  
Su-Kam Power  
Hero steel  
Poggenamp  
Schneider Electric  
Uttam Bharat Electric  
Transformer & Rectifier  
Mangal Electric

Kotsons  
Alstom  
BRG  
Emco  
Navkar Transcore  
Danke Electric  
Electrotherm  
Vilas Transcore  
Galaxy Stampings

Enpay Transformers  
Pressmatic Engineering  
Elgi Equipments  
Kirlosker  
Lubi Pumps  
Wilo-Mather&Platt  
Sabar pumps  
Unnati pumps  
La-gajjar Pumps

Weg  
Vijay Electric Ltd  
Bajaj Electrical  
Kryfs  
MKS Transformer  
Polmot motor  
Rajastan transformer  
SR Electrosteel  
Voltec



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