

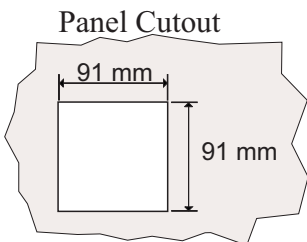
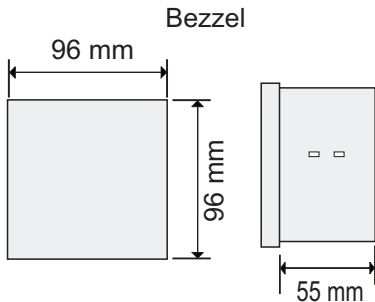
# POWER ANALYZER



## FEATURES

- State of Art Microcontroller Based Design
- 4 Line 4 Digit ultra bright LED display
- Site programmable CT ratio( Primary & Secondary)
- Site programmable PT ratio ( Primary & Secondary)
- True RMS measurement
- Password Protection
- Maximum demand with Relay contact
- RS 485 Computer Interface
- Harmonics ( Individual & Total )
- Auto Ranging
- Universal Aux. Supply

## MECHANICAL DIMENSION



## PARAMETERS

- ✓ Volts : R Y (Phase - Phase)  
YB (Phase - Phase)  
BR (Phase - Phase)  
Average (Phase - Phase)  
RN (Phase - Neutral)  
YN (Phase - Neutral)  
BN (Phase - Neutral)  
Average (Phase - Neutral)
- ✓ Amps : R Phase  
Y Phase  
B Phase  
Average
- ✓ Power Factor : R Phase  
Y Phase  
B Phase  
System
- ✓ Active Power : R Phase  
(KW) Y Phase  
B Phase  
Total
- ✓ Apparent power : R Phase  
(KVA) Y Phase  
B Phase  
Total
- ✓ Reactive Power : R Phase  
(KVAr) Y Phase  
B Phase  
Total
- ✓ Frequency : System
- ✓ Phasor Angle ( Phase wise)
- ✓ Phase Angle (Phase wise)
- ✓ Import Maximum Demand
- ✓ Import Peak Maximum Demand
- ✓ Export Maximum Demand
- ✓ Export Peak Maximum Demand
- ✓ Import Active Energy
- ✓ Import Reactive -Inductive Energy
- ✓ Import Reactive -Capacitive Energy
- ✓ Import Apparent Energy
- ✓ Export Active Energy
- ✓ Export Reactive -Inductive Energy
- ✓ Export Reactive -Capacitive Energy
- ✓ Export Apparent Energy
- ✓ Harmonics - Volts - Total ( THDV Phase wise & Avg )
- ✓ Harmonics - Amps - Total ( THDI Phase wise & Avg )
- ✓ Harmonics - Volts - Individual (upto 31<sup>st</sup>) on RS485
- ✓ Harmonics - Amps - Individual (upto 31<sup>st</sup>) on RS485
- ✓ Load Hour - Import
- ✓ Load Hour - Export
- ✓ ON Hour(for which the meter is on with/withoutload)

## DISPLAY PAGES

Page	Symbol	PARAMETERS
1	V L-L	Voltage (L-L) RY, YB, BR & Average
2	V L-N	Voltage (L-N) RN, YN, BN & Average
3	PHr	Phasor Angle between Voltage in degrees
4	A	Amps R, Y, B & Total
5	Hz	Frequency
6	W	Watts (Active Power) R, Y, B & Total
7	Var	VAr ( Reactive Power) R, Y, B & Total
8	VA	VA ( Apparent Power) R, Y, B & Total
9	PF	Power Factor R, Y, B & System
10	PHI	Phase Angle between volt & Amps in degrees
11	I <sub>nd</sub>	Import Maximum Demand
12	I <sub>Pnd</sub>	Import Peak Maximum Demand
13	E <sub>nd</sub>	Export Maximum Demand
14	E <sub>Pnd</sub>	Export Peak Maximum Demand
15	I <sub>RE</sub>	Import Active Energy
16	I <sub>rLE</sub>	Import Reactive - Inductive Energy
17	I <sub>rCE</sub>	Import Reactive - Capacitive Energy
18	I <sub>RPE</sub>	Import Apparent Energy
19	E <sub>RE</sub>	Export Active Energy
20	E <sub>rLE</sub>	Export Reactive - Inductive Energy
21	E <sub>rCE</sub>	Export Reactive - Capacitive Energy
22	E <sub>RPE</sub>	Export Apparent Energy
23	u <sub>t</sub> h <sub>d</sub>	Harmonics - Voltage - THDV Phase wise & Avg
24	i <sub>t</sub> h <sub>d</sub>	Harmonics - Current - THDI Phase wise & Avg
25	Onh <sub>t</sub>	ON Hour (duration for which the meter is ON with /without load)
26	Ld <sub>t</sub> I	Load Hour (timer) - Import
27	Ld <sub>t</sub> E	Load Hour (timer) - Export

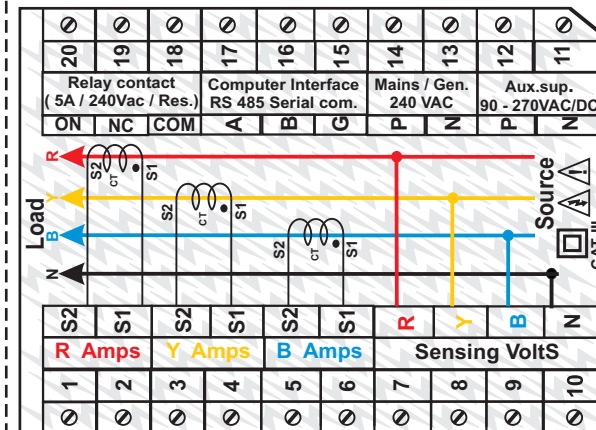
## SPECIFICATIONS

- Input : 3 phase 4 wire / 1 phase 2 wire
- Volts : Range 10-500v
- Amps : 0.015 to 6.00Amp
- Burden : 0.2 VA max. per phase for Voltage & Current Inputs  
3 VA max. on Aux. Supply
- Aux. Supply : 90 - 270 VAC / DC
- Display : 4 Line x 4 Digit  
{0.39 Inches 7 Segment LED Display}
- Computation : True RMS
- Frequency : 45 Hz - 65 Hz.
- Ambient : -10 to 55°C
- Storage : -20 to 75°C
- Humidity : < 95 % Non-condensing
- Weight : 280gms
- Dimensions : 96 X 96 X 55 mm ( L x W x D )
- Panel Cutout : ( 90<sup>+1</sup><sub>-0</sub> )mm X ( 90<sup>+1</sup><sub>-0</sub> )mm
- Mounting : Flush Mounting with side clamps.

## Measurement range :

- Volts : 10 - 500VAC L-L
- Amp : 0.015A - 6.00Amp AC
- Display update : 1Sec
- Hz : 45.0 to 65.0HZ
- Resolution : 0.1 for Energy , Auto ranging for other parameters.
- Accuracy : ±0.5% of full scale for voltage, current, power, power factor.
- Frquency : ±0.1% for Hz
- Energy : class 1.0

## Electrical Wiring / Connection Diagram



# PROGRAMMING

1) Press key to enter Program Mode.

2) The Meter Shows Password Entry Page {USR PASS 0000}.

Enter the Password using Key to increment count & Key to move to the next digit. After entering the password press key, if the pass word is correct, the unit will enter the program mode.

Default factory set password is 2000

3) Following Programming menus are available

Menu	Symbol	Description
1	Addr	Unit Address for RS485 communication.
2	Pt-r	To set PT Primary & Secondary Value
3	Ct-r	To set CT Primary & Secondary Value
4	CLr I	To clear Import Energy
5	CLr E	To clear Export Energy
6	nPAS	To set New Password
7	mdEY	To select MD type
8	mdIt	To set MD Integration time
9	md-I	To set MD Threshold for Import
10	md-E	To set MD Threshold for Export
11	CPd I	To clear Peak MD Import
12	CPd E	To clear Peak MD Export
13	bAUD	To set baud rate & odd / even parity
14	COnt	To Reset ON Timer
15	CLt I	To Reset Import Timer
16	CLt E	To Reset Export Timer
17	SCrL	To Select Auto / Manual Scroll

Select the Menu to be edited using Keys and press Key to enter respective menu.

Menu 1:(Unit Address for RS485 communication) when Key is pressed the display shows {Addr 001}.

The address can be edited using Keys. After entering desired value press key to save value.

Menu 2:(To set PT Primary & Secondary) when Key is pressed the display shows Pt-r {Pt P 0001 & Pt S 0001}.

The value can be edited using Keys. After entering desired value press key to save value.

For eg. If PT ratio is 22KV / 110V you can enter value as 0200 0001.

Menu 3:(To set CT Primary & Secondary) when Key is pressed the display shows Ct-r {Ct P 0001 & Ct S 0001}.

The value can be edited using Keys. After entering desired value press key to save value.

Menu 4: (To clear Import Energy) when Key is pressed the display shows CLrI. Press key once again, unit reconfirms by asking "ru SUR E ? CLrI" By pressing Key once again the Import energies will get clear or press Key to come out.

Menu 5: (To clear Export Energy) when Key is pressed the display shows CLrE. Press key once again, unit reconfirms by asking "ru SUR E ? CLrE" By pressing Key once again the Export energies will get clear or press Key to come out.

Menu 6:(To set New Password) when Key is pressed the display shows "CHG PASS 0000".

The password can be edited using Keys. After entering desired value press key to save value.

Menu 7:(To select Maximum Demand (MD) Type) when Key is pressed the display shows "md type".

By Pressing Key ACT (Active power) or APP(Apparent Power) can be selected. After selecting desired type press key to save.

Menu 8: (To set MD Integration time) when Key is pressed the display shows "mdIntp".

The time can be edited using (time is in minutes). After entering desired value press key to save value.

Menu 9 : (To set MD threshold for Import) when Key is pressed the display shows "md -I". The threshold can be edited using & Keys. After entering desired value press key to save value. Once this threshold crosses Relay will Energise for 30 Seconds. The value to be entered should be in kW / kVA.

Menu 10 : (To set MD threshold for Export) when Key is pressed the display shows "md -E". The threshold can be edited using & Keys. After entering desired value press key to save value. Once this threshold crosses Relay will Energise for 30 Seconds. The value to be entered should be in kW / kVA.

Menu 11 : (To clear Peak MD Import) when Key is pressed the display shows CPdI. Press key once again, unit reconfirms by asking "ru SUR E ? CPdI" By pressing Key once again the Peak MD import will get clear or press Key to come out.

Menu 12 : (To clear Peak MD Export) when Key is pressed the display shows CPdE. Press key once again, unit reconfirms by asking "ru SUR E ? CPdE" By pressing Key once again the Peak MD Export will get clear or press Key to come out.

Menu 13: (To set the Baud Rate & Parity) when Key is pressed the display shows "baud". The Baud Rate for RS485 communication can be set using key. Using key you can select Baud / Parity menu. The Even / odd / none parity can be set using Key.

After entering desired value press key to save value. Maximum Baud rate 9600.

Menu 14: (To Reset ON TIMER) when Key is pressed the display shows COnt. Press key once again, unit reconfirms by asking "COnt ru SurE" By pressing Key once again the ON TIMER will get clear or press Key to come out.

Menu 15: (To Reset IMPORT TIMER) when Key is pressed the display shows CLtI. Press key once again, unit reconfirms by asking "CLtI ru SurE" By pressing Key once again the IMPORT TIMER will get clear or press Key to come out.

Menu 16: (To Reset EXPORT TIMER) when Key is pressed the display shows CLtE. Press key once again, unit reconfirms by asking "CLtE ru SurE" By pressing Key once again the EXPORT TIMER will get clear or press Key to come out.

Menu 17: (To select Auto / Manual Scroll) when Key is pressed the display shows SCrL.

You can select "dIS" to disable Auto scroll or select "EN" to enable Auto scroll using & Keys.

Press Key to come out of Program MODE.

## Notes :

- 1) MD relay will come ON for 30 secs once the set threshold is crossed.
- 2) 230VAC input has to be given across terminal marked M/G to put the meter in Export/ DG mode for dual source operators.
- 3) Ensure S1,S2,CT connectors & R, Y,B sequence is correct. In case S1,S2 is reverse watt reading will appear with a negative sign.
- 4) When M/G input is available watt readings will become negative to indicate now DG/ Export mode is active.
- 5) The meter can also be put in DG/ Export mode by sending a broadcast command on RS485 Bus (see protocol details). In this case 230VAC need not be applied on the M/G terminals.

## Safety Precautions :

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

If there is physical damage to the unit then do not use it.

Read complete instruction prior to installation and operation of the unit.

## Wiring Guidelines :

- 1) To Prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
- 2) Wiring shall be done strictly according to the terminal layout with shortest connection. Confirm that all connection are correct.

## Caution :

- 1) To ensure the safe operation of unit, check the wiring and connections.