A Smart Solution for Reactive Power Compensation

- Advance microprocessor system
- Data storage facility
- 4 Line LCD display
- Three phase CT sensing
- Fast response thyristor system
- RS 232C/485 Printout Facility
- Switch OFF facility when Generator is ON

- Thyristorised APFC System
- Contactor switched APFC system.
- Thyristor switched contactor run APFC system.

आपण पॉवर फॅक्टरचा दंड भरता काय ?

POWERZONE

TÜV SÜD ISO 9001

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APFC SYSTEM

TECHNICAL SPECIFICATIONS

Controller Function :

1 Built with microprocessor and based on FCP system (Fast Computerised Programme)

2 Intelligent instrument able to accuracy inform about electrical network status with true RMS measurement of each phase and to take complex decision and do large number of calculations for automatic connection and disconnection of capacitor steps as per load requirements to maintain target power factor.

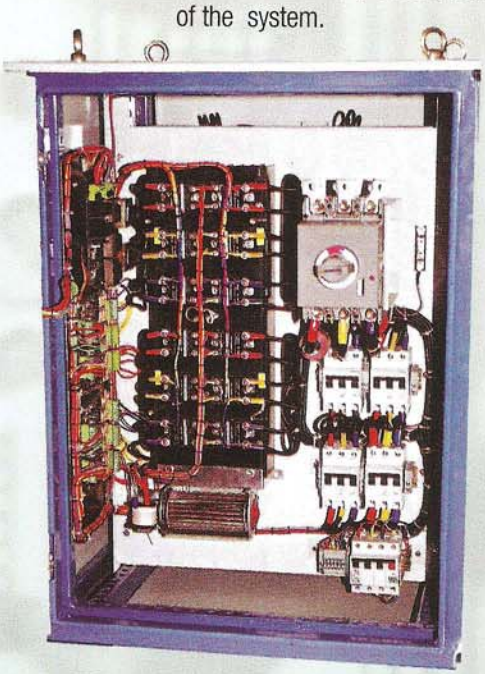
3 Three phase sensing suitable for three phase unbalance loads and perfectly suitable even for Indian supply condition.

Memory storage :

Memory storage system records and storage various electrical parameters on hourly/half hourly basis for 45 days. Printout facility is available.

LED Indications :

1 B1 to B16 : To show ON/OFF status of capacitor bank.
2 PON : To indicate power ON.
3 RMT : To indicate remote communication.
4 DATA DNLD : To indicate Communication (ON Data downloading)
5 INST PRINT : To indicate printing of instantaneous Electrical data is in progress.
6 AUTO : To indicate that the controller is in Automatic Mode.
7 Man : To indicate that the controller is in Manual Mode.
8 PROG : To indicate that the controller is in Programme Mode.
9 STD BY : To indicate some problem in functioning of the system.



Thyristoriesed APFC inside view

Technical Characteristic of Controller :

1 Operating voltage
415/440 V AC, 3phase, 4 wire input.

2 Accuracy : +/- 2%

3 Frequency : 50 Hz, 60 Hz.

4 Rated Current : In/5A or In/1A

5 Power Consumption of Controller : 5 VA

6 P. F. Setting : 0.85 lag to 0.95 lead.

7 Measuring Voltage :
30-300 V AC, line to Neutral.

8 Sensitivity :
40mA/10mA, depending upon CT output.

9 Switching Time :
Selectable from milliseconds to minutes.

10 Alarm Relay : Available optional

11 Display : 4 Line, 20 Characters, Backlit LCD.

12 Storage Parameters :
Voltage, Current, P.F., Power for all three phases.

13 Protection :
High Voltage, Low Voltage, Imbalance Voltage, Zero/Under loaded Current /Over Temperature, Capacitor Current Overload, Incorrect phase sequence and high Capacitor current surge due to external influence

14 Housing : 144 X 144mm

15 Cascade Connection :
Two Controller can be cascaded

16 Computer Interface :
RS 232/RS485* standard output port to interface with advance Software* to take control of complete system (*optional)

17 Switching Device :
Suitable for Hybrid / Thyristor / Contactor.

18 Connections :
All connections through plug in Connectors.

19 Connection Diagram :
At rear side of Housing.

Modules

POWERZONE APFC SYSTEM

A SMART SOLUTION FOR POWER FACTOR IMPROVEMENT

POWERZONE SYSTEMS (INDIA) PRIVATE LIMITED is a strongly research and Development base Company in the field of Reactive Power Compensation Systems with practical experience and versatile Market Response Team. It is the art of save Power and not to generate the Power by this simple means with highly intellegent microprocessor based to control the connection and disconnection of capacitor steps to achieve require target Power factor.

Source of requirement for the APFC System : Inductive loads in the LT network i.e. commercial establishments like offices, Industries, AC/DC Motors, AC/DC Drives, Rectifiers, inverters, Compressors, Inductive furnaces, etc. are causing major energy losses, means operate on poor power factor. The reactive power required in such plants varies rapidly with energy cycle. The response speed of compression systems are not suitable to take care of rapidly varying loads. The normal conventional systems have limitations due to switching elements, slow response measurements and computation Systems. The normal conventional operates with electro machanical switches to switch on and off capacitors are not suitable for fast varying load.

The uncompensated reactive power results in low power factor system is the need of today.

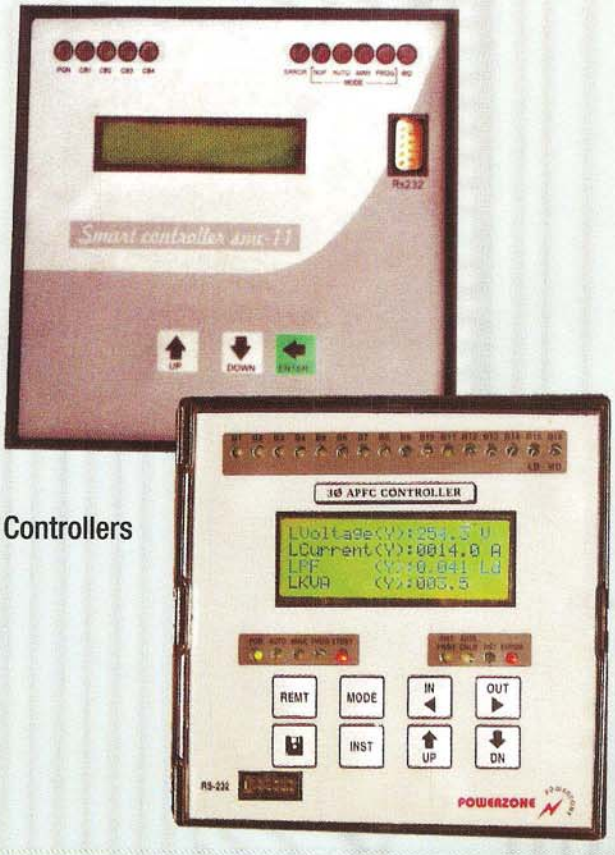
Working Principle of APFC system :

It is the intellegent instrument with built in microprocessor able to inform about electrical network status with fine RMS measurement of each phases and to take complex decision and do large number of calculations for Automation connection and disconnection of capacitor steps as per load requirement to achieve and maintain target power factor. All three phase parameters i.e. voltage, currents power factor is sensed by the related potential transformers, current transformers and from the feed back signal of all the electrical parameters are sensed and calculated.

POWERZONE APFC systems, switching off capacitors is done by solid state relays, thyristors which are automatically connected to capacitor during capacitor zero crossing, which effects to allow switch on capacitor without transient current. This system senses the KVAR requirement to each cycle and injects required capacitors to achieve set target Power Factor Automatically.

Special Features of the Controller and System :

1 Operates in three modes of operation-Auto Mode, Manual Mode and Programme Mode.
2 Display of all electrical network parameters i.e. voltage, current Power Factor of each phases, KW, KVA, KVAR of each phases, capacitor current of each phases Cummulative KVAR,KWH, KVARH.



Controllers

Wall Mountable Contactor APFC

FEATURES OF CONTROLLER :

1 **Programmable upto 16 steps**

2 **Smooth and surge free switching of capacitors.**

3 **Self Diagnostic capability.**

4 **Four line LCD Display of Electrical parameters of load end as well as transformer end :**

- ▶ Time, Date and User ID
- ▶ Voltage of each phase.
- ▶ Load Current of each phase.
- ▶ Power factor of each phase in 3 digits
- ▶ Capacitor current of each phase and each bank.
- ▶ KW for each phase.
- ▶ KVA for each phase.
- ▶ KVAR for each phase.
- ▶ Cumulative kW, KVA and KVAr of all three on average basis.
- ▶ Injected capacitance (KVAR) for each phase to reach target Power Factor.
- ▶ Electrical Active Energy (KCRH)
- ▶ Phase Sequence Indication.
- ▶ Programable Parameters.
- ▶ Pre Indication of control action.
- ▶ THD% both voltage and current (optional).

5 **Programable Parameters :**

- ▶ Response Time 40/60millisecond to 120 second.
- ▶ CT Ratio - 8 selectable values upto 4000A.
- ▶ Minimum 1st capacitor step - 3KVAr to 90 KVAr (140 optional)
- ▶ 18 nos Switching programs available.
- ▶ Target P.F. - from 0.85 lag to 0.95 lead.
- ▶ Phase sequence synchronization.

6 **Protection :**

- ▶ Avoid high voltage and flash across busbar.
- ▶ Capacitors protected against High Voltage.
- ▶ Over temperature protection of Thyristors.
- ▶ Protection against voltage imbalance and very low voltage.
- ▶ Protection against zero current in any of the phase.
- ▶ Auto restart facility (after 'fault' is disappeared)
- ▶ Keyboard lock facility (optional)

7 **Display Kit :**

User friendly key board is provided for following. Up and Down keys to view display parameters by scrolling. MODE key is provided for change the functions of controller in each mode viz. a) Auto Mode b) Manual Mode c) Programme Mode to change programmable parameters as mentioned above d) Standby Mode.

8 **Computer Interface for taking printouts.**

9 **RMT Key :** For remote communication through interface.

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