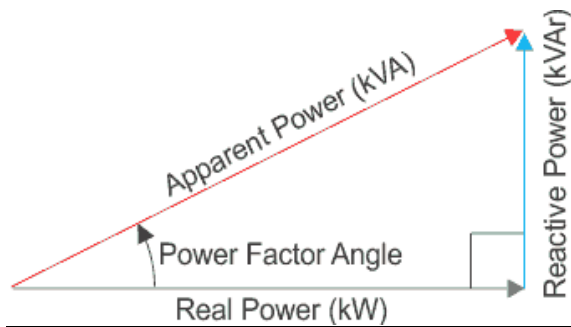


SME – APFC Panels Description:

APFC Panel means Automatic Power Factor Correction Panel. In some cases, in industrial applications, the loading pattern of the entire network will change from time to time. So if that type of Industries connect a fixed compensation. It will not be in a position to compensate exactly what is required for Power Factor. But, in case of APFC panels that type industry will have a microprocessor or Micro controller based relay which helps you to sense the load current instantaneously and the particular MC relay will hunt for capacitors to compensate and power factor improvement will be automatic. APFC is nothing but steps of capacitors connected to the contactor in turn connected to the breakers and relay. It doesn't require much of the manual support as of fixed compensation is concerned. Your power factor will be improved automatically; APFC will have a step by step compensation.



SME – APFC Panels Best Suitable for

- ✓ LT & HT factories
- ✓ Wind mills
- ✓ Rice mills
- ✓ Textile and Spinning Mills
- ✓ All type of Industries
- ✓ Welding factories
- ✓ Furnace Industry
- ✓ And other types of industries also.

SME - APFC PANELS:



Automatic capacitor banks and Automatic Power factor Correction Panels of inductive character loads in low voltage power networks.

SME - APFC Panel Construction:



Power Factor Panels are constructed in steel-plate cabinets (vertical construction mounted type by smaller power ranges). The Panels are equipped with Automatic Power Factor Controller regulator, switching contactors, MCBs, Cylindrical capacitors Brands like EPCOS, ABB, SCHNEIDER ELECTRIC, L&T and fuses.

Main switch is installed in all APFC Panels (three-phase circuit breaker or fuse switch). We have different types of APFC, DPFC and RPF Panels Manufacturing and given to the right product to the industries depends on their loads and connection patterns.

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SME Standard Power Factor Panel ranges

Types of SME Automatic Power Factor Control Panels are as below;

- SME APFC Panels 5 – 35 kvar (wall-mounted)
- SME APFC Panels 10 – 87.5 kvar (wall-mounted)
- SME APFC Panels 75 – 150 kvar (wall-mounted)
- SME APFC Panels 110 – 400 kvar (standard)
- SME APFC Panels 300 – 1200 kvar (standard)
- SME PFC Panels RF 60 – 920 kvar (detuned)
- SME DPFC Panels 60 – 1260 kvar (fast-switched)

Customized solution for panels and design also available to us. For more information, please contact Our SME technical team for your suitable panels.

The Automatic Power Factor Correction Systems are Optimal Solution for;

- Economic Solution by single Centralized Power Factor Correction Control System
- Varying Load Patterns which demands changing Reactive Power Compensation
- Avoidance of problems that is due to leading PF conditions by Fixed Compensation

SME – APFC Panel Salient Features:



Microprocessor based Power Factor Controller with special features such as,

- THD measurement
- Alarm output
- FCP System (Fast Computerized Program), minimizes the number of ON/OFF operations
- Precise and quick relay controls
- displays all measurements on one single display
- connected steps display
- features designed for easy and intuitive handling by the user

- parameter setting in RUN-TIME
- totally digital setting and handling
- 4 quadrant PFC Measurement
- Maintains Good Power Factor constantly
- High efficiency
- Accuracy of +0.8% for Reactive Power, + 0.5% for Current 6 or 12 steps to operate Capacitor Circuits. (Accuracy percentage varies from power factor controller to power factor controller i.e. one brand to another brand)
- Alarm for excess operation than programmed limits.
- Dual control curve characteristics: to avoid over compensation under light loads and to avoid inductive reactive power under regenerative conditions. Available in selected models.
- Monitoring of harmonic levels continuously with alarm and safety trip facility. Available in selected models.
- Zero voltage & Zero current tripping with alarm signals. Available in selected models.
- Parameters Measured and Displayed
 - Voltage
 - Current
 - Reactive Power
 - Power Factor
 - Frequency
 - Harmonics

Technical Details as FAQ

✎ Power factor understanding by way of Billing Parameters:

1. KWH (Active Power) - True Power required by a Load to be operated.
2. KVAH (Apparent Power)- This is Vectorial Sum of Active power & Reactive Power
3. What is the total power supplied by the electricity board.
4. Power factor -This is the ratio of Active power to Apparent Power (KWH/KVAH)
5. KVAR (Reactive Power) – Inductive Loads require another form of power called Reactive Power (KVAr) to establish and maintain magnetic field.
6. Total Supplied energy KVAH= Active power Divided by Power factor.

✎ What is the Power Factor?

In simple terms: Power factor is the measure of Electrical efficiency.

In Technical terms: It is the ratio of active power (Kwh) To Apparent Power (KVAh)

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✎ In general what should be the value of power factor?

Power factor to any connected load should be one or unity (1.00). When PF is unity or one, it means that for any connected load the total energy supplied is consumed without any wastage. This can be simply explained as both the KWh Units and KVAh units will be the same.

✎ What are the equipments that cause damage to the power factor?

Some of the equipments that cause damage to the power factor are as below:

1. Fluorescent Lamps
2. Air conditioners
3. Motors
4. Lighting Ballasts
5. Welding equipments
6. Battery Banks
7. Transformers
8. Switchgears
9. Cables

✎ Leading with an example with respect to a bill, how power factor effect the bill?

For example,
KWh Units: 5436
KVAH Units: 7243
PF= $KWh / KVAh = 5436 / 7243 = 0.75$

✎ Why is there a difference of 1807 Units between Actual Consumption (KWh) & Total Supplied Energy (KVAh)?

In addition to actual power (Kwh) Inductive loads (Ex: Motors, Transformer, Relays, etc) require another form of power called Reactive power (KVAr), which is required to create magnetic field for the operation of the load. The Reactive Power is the Excess amount of energy that is being drawn from the mains, which is the difference of 1807 units between KWh units and KVAh Units.

Considering the price per units as Rupees 10,
1807*10=18070 Rupees, for a month this Rs.18,070/- is the excess amount that is paid for not maintaining the power factor. On an average when calculated for an year

18070*12 Months=Rs.2, 16,840/-

✎ Is there a possibility of Improving power factor if so, how?

Yes! There is a possibility of improving power factor.

We at SME provide Solutions for power factor correction for the loads that causes damage to the Power Factor. Our APFC Panels continuously monitors the power factor with respect to the load operating and switches ON/OFF with the necessary reactive power to the line and there by sees that the power Factor is always being Maintained near to unity or 1.00.

✎ What does Capacitors do in power factor correction?

They act as reactive power generators and provide the reactive power to the load when necessary.

✎ Technically what is the role of SME APFC Panel Systems?

SME Power Factor Control Panels is a custom based design planned for each and every customer with respect to the load conditions study at customer premises.

SME Power factor Correction Control systems consists of capacitor banks with different ratings connected to the mains line with a control system.

This Control system continuously monitors the load and switches ON/OFF the required Capacitors from the PFC Panel of different ratings as per the requirement and sees that a power factor is always being maintained near to unity or 1.00.

✎ What are the features Involved in SME APFC Panels or Power Factor Panels?

- ✎ Micro controller based Power factor Controller technology.
- ✎ Customer Load based production and design Power factor panels.
- ✎ Electricals Standard make components used the Panels.
- ✎ Required Spacious for healthy life of Panel Components.
- ✎ Small rated steps are used for high accuracy.
- ✎ Proper cooling methods used for components and Capacitors high life duration.
- ✎ Individual protection for capacitors through MCBs.
- ✎ Individual steps operation for capacitors through Capacitor duty contactors.

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SREE MEENAKSHI ELECTRICALS



- ✦ Separate Fuses protect for Micro controller and cooling fan.
- ✦ Separate Indicator for 3 phase (R,Y, B)
- ✦ Quality Current Transformer for better Accuracy.
- ✦ Separate auto/ Manual Switch for Optional customer Requirements.

✦ What is the disadvantage of Direct or Fixed Capacitors When Compared to Automatic System?

Capacitor when connected to the line should be as per the load operating time. Suppose, for the total load as per calculations if 300KVAR Capacitor bank is required and at the instant time, if there is only 50% of the total load is in running condition and the 50% OFF the load condition. At this scenario only

150 Kvar might be sufficient. But 300KVAR is Connected to the line.150 KVAR that is additional than the requirement continuously charges and discharge energy. Which is a necessary consumption of energy, which will be billed and also with the excess capacitors? Connected to the line induces over voltage which will harm the electrical loads that are in operation. There is no guarantee to Power factor being maintained with direct capacitor connected to the line and Man power also wasted for capacitors ON and OFF Operation time.

✦ What does SME need from you?

We require a copy of your latest electricity bill and your plant total connected load details, and capacitors already connected means that details as well as that healthy condition details and maximum demand reached KVA.

Mail us to

contactus@sreemeenakshielectricals.com

We will do the diagnosis and come with the best possible solution that suits you.

SME APFC Panels Benefits are as below

Direct Benefits:

- ✦ Reduction in MD kVA
- ✦ Less kWhr Consumption
- ✦ Decrease in kVAHr Charges
- ✦ Avoidance of PF Penalty
- ✦ Increase in productivity
- ✦ Avoid Excess bill due to low power factor maintained.
- ✦ Substantial savings on Monthly bills.

Indirect Benefits:

- ✦ Reduces End Termination Darkening or Burn Outs
- ✦ Avoidance of Motor winding and Machinery failures
- ✦ Improved System Performance due to Healthy Voltage
- ✦ Less Electric Break Downs/ Decreased Plant Down Time
- ✦ Reduces the transformers from heating.
- ✦ Increase the Life of the Equipments.
- ✦ Ultimately Low pay back period.

For further clarifications and queries contact:

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