

In automobile industry, major contribution is of two phase welding load having huge unbalance and dynamic fluctuations in all three phases of system. This rapid load fluctuation consumes large amount of reactive power causing large voltage drop which reduces the welding quality and efficiency.

Welding equipment draws high current for a very short time which may result in voltage dips. The normal three phase reactive power compensation system is not applicable for such types of loads because of unbalance power factor in each phase.

### Specification

- Voltage : 230V/415V/440V, Frequency : 50 Hz, 1 Ph, 2 Ph, 3 Ph
- Advanced DSP Micro Processor controlled reactive power regulator
- Switching device : Thyristors equipped with SCR, heat sink, firing module.
- Metal cabinet (indoor) powder coated with IP4X & forced cooling fan.
- Incomer : MCCB/ACB/SFU
- Capacitors : All polypropylene film (APP) film + foil design, MPP (Metallised polypropylene film) design.
- Connection : Delta/Star

### Features

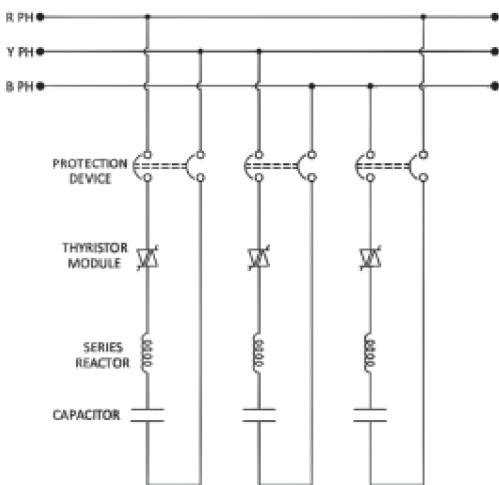
- In this scheme, specially designed two phase or single phase capacitors are used. Each capacitor step is controlled by high speed thyristor switches.
- Detuned series reactors are used in series with each capacitor to avoid resonance and for harmonic blocking purpose.
- The change in Reactive Power during the packet of welding cycles is adjusted by Shreem-DRPC to maintain the Power Factor near to unity.
- This gives rise to reduced maximum demand, improved Power Factor, reduction of losses in the system due to reduction of line current.
- Minimizes voltage fluctuations & Improvement in welding process & productivity.
- Advanced DSP Micro Processor controlled reactive power regulator with 3-phase reactive power measuring and individual regulation of reactive power in three phases is used for switching of capacitor banks.
- Hybrid compensation with 2 Ph & 3 Ph possible with this system.
- **Current free wheeling low wattage resistors across Series Reactor to reduce insulation stresses.**



### APFC Controller

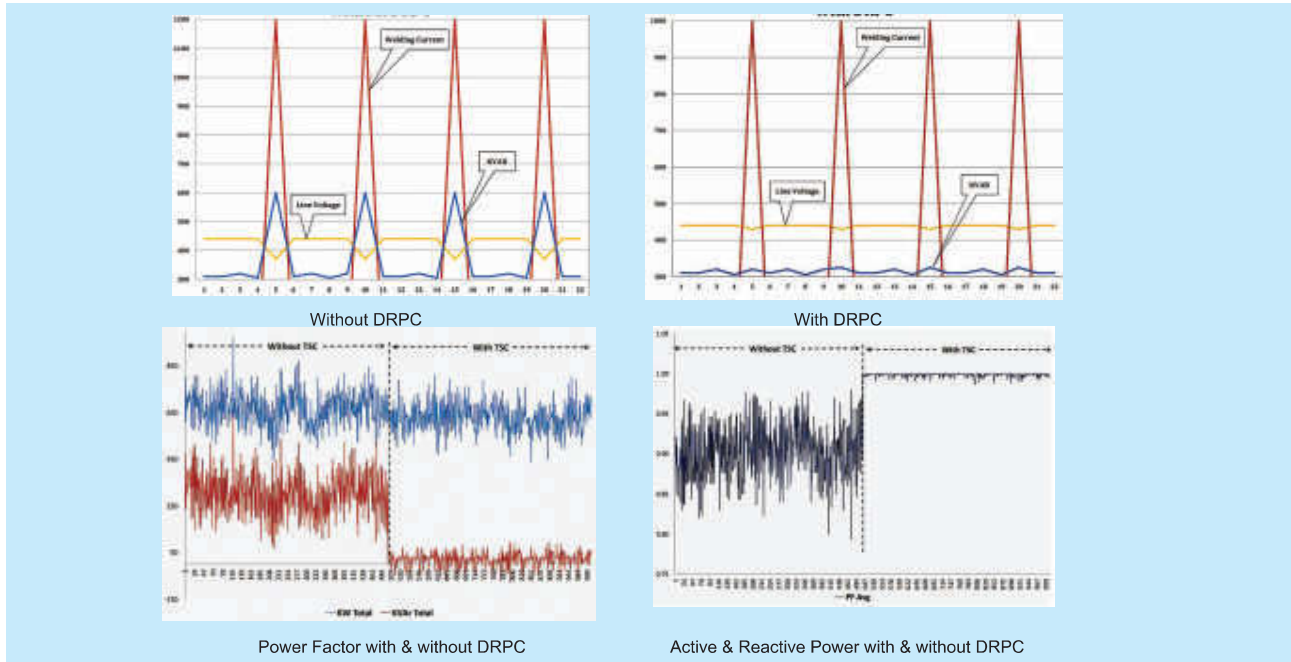
Advanced DSP Micro Processor controlled power regulator with 3-phase reactive power measuring and individual regulation of reactive power in three phases.

- Internal microcontroller : 16bit DSP Micro Processor.
- Display : LCD with backlight and clear text menu
- Programmable phase-offset 00 – 3450 in 150 steps
- Range of temperature measuring : 200-1000c
- Digital input : 50-250 V AC, programmable
- RS485 Modbus (optional)
- Data-logger for measuring + event recorder, real time clock and 2 digital input with 24V DC (optional)
- Automatic detection of capacitor, capacitor size and phase of capacitor
- Free sequence of the capacitors
- Permanently updating of the capacitor sizes to the actual values.
- The status of each capacitor is permanently displayed on LCD.
- 4 quadrant operation (import or export of active work).
- Best-Fit algorithm to get soon and exact results of regulation.
- 2nd parallel algorithm for fine-tuning.
- Regulation of fundamental wave reactive power, to be independent from harmonics, which cannot be compensated by switching capacitor steps.
- The reactive power for regulation is rated to nominal voltage for the best possible results.
- Programmable Under/Over voltage regulation.
- Programmable over-temperature protection.
- Fan control by using digital output (temp level 1).
- Overload alarm for current path.
- Automatic checking of current path when there is zero current and alarming.
- Programmable monitoring and alarm system with alarming in LCD. alarm contact, digital output, 2nd target PF, Freeze operation (all steps are frozen) or stopping operation (all steps are off) with the following alarms: - control alarm, over-under voltage alarm, internal function, zero current alarm, overload current path alarm, step failure alarm, step maintenance alarm, power factor alarm, THD U alarm, THD I alarm, overload kW alarm, over kVAr alarm, kW export alarm, temperature level 1 and 2, digital input alarm.
- Measuring system shows the following values: voltage, current, THD, kVA, kVAr, cosphi (DPF), Power Factor L1/L2/L3/total. Frequency, temperature, kWh imp/exp, kVArh cap/ind, Harm. U 2nd – 30th (even and odd), Harm. I L1/L2/L3 2nd – 30th (even and odd).



Typical Scheme for 2 phase welding load compensator

## Waveforms for dynamic load PF correction for 2 phase spot welding load



### Applications

- Single or two phase Robotic welding load in automobile industry, 3 phase CRM, HRM, Induction heating, Press machine load.
- Single phase traction/Railway load.

## Fix / Semi Automatic Capacitor Bank



### Specifications

- Voltage : 415V/440/525V/690V
- Frequency : 50 Hz/60 Hz
- KVar : 9/18/27/36/50/75/100/125/150/300 kVar.
- Capacitor : All polypropylene film (APP) film + foil design. MPP (Metallised polypropylene film) design.
- Protection : MCB/MCCB/SFU
- Natural / Forced cooled IP-4X cabinet.
- With & without Series Reactor.
- Mounting : Floor/Wall/Pole.

### Applications

- Power Factor correction for fix load like motors, distribution transformer.

## Micro APFC Panel



### Specifications:

- Voltage : 415V/440V
- Frequency : 50 Hz/60 Hz
- PF Controller : Microprocessor based SPF-0X relay.
- Operation mode : Auto in maximum 5 steps.
- Switching : Contactor/Thyristor switch.
- Main protection : MCCB
- Feeder protection : MCB
- Range : 25 kVar to 100 kVar

### Applications:

- PF correction for small industries, commercial loads, Distribution transformer load.