

Servo Voltage Stabilizers

In spite of the best efforts by all the state electricity boards across the country, the voltage received at the end user is never constant. This erratic power supply is the main cause of breakdown of electrical equipment. Voltage varies in a fashion that generally it is low during day time and high during night hours. Moreover on the holidays, peak hours, rainy days and when agriculture load is switched off, the voltage rises sharply which is more dangerous. In India all the electrical equipment are rated at 400 / 415 Volts three phase and 220 / 230 Volts single phase. If the system voltage is higher / lower than the rated voltage, the following consequences have been observed :

	UNDER VOLTAGE	OVER VOLTAGE
A.C. Motors	It reduces the capacity of the motor thereby raising the temperature of the motor and reduction in motor life. Also RPM of motor is reduced thereby decreasing the production efficiency	It results in additional power consumption, premature failure of windings, increased losses of cables, switches, transformer and other associated equipment.
Lighting Equipment	More luminaries will be required to get the normal lighting.	It curtails the service life of the incandescent lamps remarkably and higher power consumption.
Resistive Heaters	Under voltage requires longer warm up periods.	Heater element deteriorates from excessive oxidation in spite of thermostatic control.
Welding Equipment	The weld time cycle is prolonged to prevent cold weld.	Weld will be over-heated resulting in poor quality of the same.
Rectifier Loads	Electroplating deposition rates drops considerably.	It increases Electroplating deposit accordingly.

The sensitive CNC machines which require a fortune to be invested, are prone to breakdown even due to slight variation in voltage. The fluctuating voltage is hazardous to expensive electronic cards of these hi-tech machines.

With the fluctuating voltage the quality of the end products say in moulding plants, welding plants etc. will not be constant thereby increasing the rejection rate.

Voltage on the higher side drops the power factor at least by square function. Low power factor decreases the overall system efficiency.

In electric motors (particularly smaller capacity upto 7.5 H.P.), The higher current requires higher setting of over load relay to avoid the frequent tripping of motors. Higher setting of over load relay has very less safety margin against single phasing and mechanical faults. For example, during any fault, suppose the relay setting is 15-20 % higher than actual operating current, then the relay will take 4-6 minutes to trip. The motor can not withstand the high current for such a long time and in most cases it burns out before the motor trip.

GTB's automatic voltage controller is meant to overcome all the above problems by maintaining steplessly a constant level of voltage irrespective of the fluctuating power supply system.

GTB's Servo consist of

Linear Plus/Minus Type Vertical Rolling Contact Voltage Regulator

These are auto wound transformers having single layer helical-coil mounted on a conventional laminated transformer core. The assembly used consists of self lubricating carbon rollers assembled on bakelite carrier boards that traverse the length of the coil track. The roller mechanism is driven by the servo motor which receives its signal from a voltage monitoring IC card on the output side of the servo stabilizer. In our regulator, we use heavy section of electrolytic rectangular copper strip instead of copper wire to minimize the losses and increase the efficiency of the equipment. Self lubricating carbon roller assemblies are used instead of ordinary carbon brushes which offers more reliability and trouble free performance of the equipment.

Range of manufacture

5 KVA- 3500 KVA

Double Wound Buck/Boost Type Series Transformer

In our Buck/Boost transformer we are using CRGO lamination to minimize iron losses and the coils of this transformer are wound with heavy sections of multi strips electrolytic copper to minimize copper losses for getting better efficiency of the equipment.

Electronic Control Circuit and Meter Panel

For monitoring and controlling voltage, a very simple electronic controlled circuit is provided. Plug-in-type IC cards are used which are specifically designed for easy on line serviceability. All electronic components are tested at full load at 55 degree Celsius for 48 hours to minimize failure. The regulator and buck boost transformer are oil cooled, housed in same or separate sheet steel tanks. Radiators, if necessary are provided for effective cooling. The coils are vacuum impregnated and oven dried as per IS.

Advantages of our Stabilizers are:

- **Reduction in breakdown of electrical equipment.**
- **Considerable power saving possible.**
- **Better utilization of existing transformer, cables etc.**
- **Maintenance of power factor and MDI if the voltage is normally high.**
- **Uniform quality of end products.**
- **Increase in productivity and better efficiency in plant due to less production losses.**
- **80% depreciation as per income tax act.**

GTB Servo stabilizers are available in a wide range and various models. The standard three phase models are suitable for balanced & unbalanced supply and loads. The standard models conform to the following specification:

Input Voltage	: 360-460 V	340-460 V	320-460V	300-460V
Efficiency (Approx.)	: 99.5%	99%	98.7%	98.5%
Output Voltage	: 400 V+/- 1%, 3 Phase, 50Hz.			
Cooling	: Naturally Oil Cooled			
Type	: Indoor			
Duty Cycle	: 100% Continuous			
Regulation	: +/- 1% or Better			
Ambient Temperature	: -10 degree C to +45 degree C			
Temperature Rise	: 30 degree C Above Ambient			
Mounting	: On Uni-Directional Wheels			
Earthing	: Two Numbers of Earthing Terminals			
Cable Termination Box	: Input / Output Connections			
Wave Form Distortion	: Virtually Nil			

Application

Though stabilizers are useful for any kind of application , these are most suitable for 24 hour continuous process plants where breakdowns due to fluctuation results in heavy financial losses. These include:

Cement plants, flour mills, Engineering units, Pharmaceutical units, Cold storages, Multiplexes, Rolling Mills, Textiles Mills, Paper Mills, Tube Mills, Rice Sheller's, Call Centers, Rubber Industries, Tea Estates, Food Processing Units, Oil & Vanaspati Plants, Footwear & Leather Units, Research Stations, Distilleries, Food & Beverages Plants, Hospitals, Nursing Homes, Clubs, Hotels, High Rise Buildings.