



POWERTEK ELECTRICALS

AUTOMATIC VOLTAGE CONTROLLER



OUR OTHER PRODUCTS

- Distribution Transformers
- Rectifiers
- AC / DC Variable Supplies
- Isolation Transformers
- Special Purpose Transformers

AUTOMATIC VOLTAGE CONTROLLER:

Automatic voltage controller is an industrial robot, which continuously monitors the voltage variation round the clock & whenever there is any voltage fluctuation, it rectifies to the desired level in few seconds.

The basic purpose of AVC is to maintain the desired voltage and to reduce the breakdown of Electrical Equipments due to low / high voltage. Power saving, Reduction in MDI and improvement of P.F will be added advantages.

In India all electrical equipments are designed for 230/400 volts single / three phase. Voltage variation is common phenomenon. The input voltage is generally low during day time and high during night hours. Apart from above, few months in a year/ few days in a month/ few hours in a day – the voltage is either low or high due to the following reasons.

- Holidays • Peak hours • Rainy days • Agriculture load
- Weather conditions etc.

Therefore for smooth function, it is suggested to install AVC with 400 Volt \pm 15% or 400 Volts \pm 20% input voltage variation range i.e. 340 - 460 Volts or 320 - 480 Volts models.

CHECK

1. You check the failure rate of Electrical Equipments such as Bulbs, Tubes, Chokes, Motors, Contactor coils and Electronic Equipments etc.

2. You check the voltage variation by installing the digital voltmeter at your security gate and note down the hourly reading of input voltage variation range for few days.

3. Note down hourly readings of current and voltage of one motor operating at constant load for 2-3 days. From the different readings you will observe that the current drawn by the motor is minimum at 390/400 volts as compared to the current drawn at other voltages. This means that power consumed by the motor is minimum at 390/400 volts.

4. Also note down hourly readings of voltage and KW from your Electronic Energy Meter for 2-3 days. From the readings you will observe that KW is minimum at 390/400 volts in most of the readings as compared to the higher voltage.

If you find that the above collected details are true then you will certainly have the advantages after installing the Servo voltage stabilizer as mentioned below:

The table below gives approximate quantitative advantages of Automatic Voltage Controller at various voltage fluctuation levels.

AT HIGH VOLTAGE:

| Input Voltage Voltage Variation Bands | Approx. Reduction in Breakdown of Electrical Equipments | | Approx. Power Saving | |
|--|---|---------------|------------------------|------------------------------------|
| | Motor Load below 10 hp | Lighting Load | Motor Load below 10 hp | Lighting Load |
| 380 - 400 volts | Nil | Nil | Nil | Nil & no servo stabilizer required |
| 400 - 420 volts | 5% | 10% | 3% | 5% |
| 420 - 440 volts | 10% | 20% | 5% | 10% |
| 440 - 460 volts | 40% | 40% | 7% | 20% |
| 460 - 480 volts | 60% | 60% | 10% | 30% |



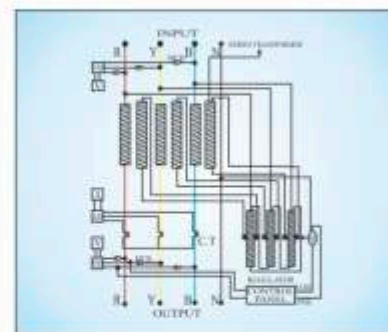
Inner View of Regulator



Carbon Roller Assembly



Close view of Carbon Roller



Basic Circuit

AT LOW VOLTAGE

1. At low voltage you will not be able to operate your machines at rated capacity resulting in lower production.
2. You need to run the machines on DG set. The power cost of DG set is three times as compared to charged by electricity board.

BENEFITS OF INSTALLING AUTOMATIC VOLTAGE CONTROLLER ON LIGHTING LOAD

By maintaining 380/210 volts - three / single phase output through Automatic Voltage Controller for Lighting Load, there will be definite saving in power bill & reduction in failure rate of lighting equipments. Higher the input voltage - more will be the savings. The overall effect on the brightness of the lamp at 210 volts will be negligible.

ADVANTAGES

- Reduction in Breakdown of Electrical Equipments
- Reduction in MDI
- Energy Saving
- Improvement in Power Factor
- Uniform Quality of End Product
- 80% Depreciation as per Income Tax Act

PAYBACK PERIOD

Owing to its high efficiency and associated benefits, the payback period for the cost of Powertek Servo Voltage Stabilizer is from 6-12 months depending upon the input voltage variation and number of working hours of the plant. The HIGHER the input voltage the SHORTER will be the payback period.

DESCRIPTION OF POWERTEK MAKE AUTOMATIC VOLTAGE CONTROLLER

Powertek Servo Stabilizer primarily consists of the following:

1. Linear Type Plus / Minus Vertical Rolling Contact type Regulator
2. Double Wound Buck / Boost Transformer
3. Electronic Control Circuit and meter panel

The regulator and Buck/Boost transformer are oil cooled, housed in same or separate steel tanks. The radiators, if necessary are provided for effective cooling. Their core is built from grain oriented silicon steel laminations which keep losses to the minimum and they are wound with electrolytic grade copper to minimise the losses, vacuum impregnated and oven dried as per IS standard.

SPECIFICATIONS

Powertek's 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 confirm to the following specification:

| | |
|----------------------|--|
| Input Voltage | 360 to 450, 350 to 460, 340 to 460, 340 to 480, 320 to 460, 300 to 460 |
| Efficiency (approx.) | 99.5% 99% 98.7% 98.5% 98.25% 98% |
| Output Voltage | 400 V \pm 1%, 3 - Phase, 50 Hz |
| Cooling | Natural Oil Cooled |
| Type | Indoor / Outdoor |
| Temp. Rise (max.) | 30 deg. C above ambient temperature |
| Mounting | On Uni - directional Wheels |
| Correction Rate | 6-8 V / Sec. (Upto 500 KVA) and 3 - 4 V/Sec. (Above 500 KVA) |
| Wave form distortion | Virtually Nil |
| Duty Cycle | 100% Continuous. |

NOTE : Non-standard input and output models are available against specific requirements.

ADVERSE EFFECTS OF SINGLE PHASING :

- a. The line current increases by 1.5 times.
- b. If the relay setting is at 15-20% higher than actual operating current then the relay will take 4-6 minutes to trip.
- c. The motor (particularly smaller capacity motors upto 7.5 H.P.) cannot withstand this high current for such a long time and in most of the cases it burns out before the relay trips.
- d. Heavy short circuit current flows through the relays, contactors, cables etc.
- e. Under this condition when the relay, contactor trips, they produce sparks and some times burst.
- f. This further damages the switchgear and in some of the cases may cause fire also.

COMPARISON BETWEEN POWERTEK MAKE AND CONVENTIONAL MAKE AUTOMATIC VOLTAGE CONTROLLER

"Powertek" Make Roller Type Regulator

- Power consumption is 0.5 to 1.5% depending upon the input voltage range
- Suitable for continuous 100% duty cycle
- Life at full load is 15-20 years
- Five years unconditional guarantee
- Negligible losses in full boost & buck condition

Conventional Make With Carbon Brush Regulator

- Power consumption is 2 to 7% under similar conditions
- Suitable for only 30% to 40% duty cycle
- Maximum life is 2-3 years at full load
- Normally guarantee for one year
- Max. Losses in full boost and buck condition

ATTENTION FOR POWER CONSUMER UNITS HAVING L.T. CONNECTIONS BUT NOT HAVING THEIR OWN DISTRIBUTION TRANSFORMER AND SITUATED IN COMMERCIAL / RESIDENTIAL AREAS:

It has been observed that the said power consumers usually face unbalanced input voltage problem and to overcome the same should install Automatic Voltage Controller suitable for unbalanced input voltage (individual phase control).

ATTENTION FOR INDUSTRIAL UNITS HAVING OLTC

The units which have already installed OLTC with their transformer, also require stabilizer due to the reason that the tapping of OLTC is not changed frequently. It is changed only when the problem of very high or very low voltage is felt. On the other hand, the stabilizer continuously monitors the output voltage level. However the Input voltage range of stabilizer can be kept low where OLTC is installed.

APPLICATION

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

- Cement Plants ■ Flour Mills ■ Engineering Units ■ Pharmaceutical Units ■ Paper Mills ■ Tube Mills ■ Hotels
- High Rise Buildings ■ Nursing Homes ■ Hospitals ■ Cold Storages ■ Rolling Mills ■ Textile Mills ■ Clubs
- Rubber Industries ■ Footwear and Leather Units ■ Rice Shellers ■ Distilleries & Beverages ■ Tea Estates
- Oil and Vanaspati Plants ■ Food Processing Units



Manufacturer & Exporter

POWERTEK ELECTRICALS

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