



GALAXY ELECTRONICS (INDIA) INC.

TECHNICAL MANUAL

FOR

Servo Control Voltage Stabilizer
1 KVA TO 500KVA

BRAND :- (GALAXY)

Website : <http://www.galaxyups.com>

GALAXY ELECTRONICS (INDIA) INC

(ISO9001-2008 CERTIFIED ORGANISATION)

B-1/204, Lok Gaurav, L.B.S. Marg., Vikhroli (W), Mumbai - 400 083.

Tel. No. +91-22-2579 0461/1800, Fax. No. +91-22-2577 0487,

E-mail : manager@galaxyups.com

INDEX

- **INTRODUCTION**
- **TECHNICAL SPECIFICATION**
- **MODES OF OPERATION**
- **OPERATING INSTRUCTIONS & CONTROL FUNCTIONS**
- **GENERAL DESCRIPTION AND PRINCIPLE OF OPERATION**
- **CONTROLS AND ITS OPERATIONS**

- **TROUBLE SHOOTING CHART**
- **G.A.DRAWING AND LINE DIGRAMS**
- **APPENDIX -A**

Letter from Chief Executive Officer,

Dear Sir,

We congratulate you on buying the GALAXY system-popular for its performance & reliability.

At GALAXY we have established stringent Production & O.C. procedures to manufacture a trouble free and totally reliable system.

GALAXY enjoys a rich experience in Power Electronics and has a major presence in the Asian and African markets today. All our products are the outcome of a persistent endeavor to offer better technology and superior performance. Even in the future, we will strive to evolve to most effective products to meet your power problems & energy solutions.

At this juncture we would like to mention that a UPS system & SCVS is meant to solve power problems at the site. Every product is a solution for the problems in the environment where the load is installed. The environment includes aspects like climatic conditions, local power conditions, connected & surrounding load, load-distribution, wiring & its rating, reversal of wiring and allied problems.

Although each system is functionally tested in the factory, final adjustment and tuning of the unit in your environment to solve the power problems is done by our engineer, at the site.

At this stage our engineer needs your co-operation for an initial period of few days, to get your operators acquainted with the UPS / SCVS operation, to collect data on the working environment and to ensure that the product stabilizers & solves the power problems at your location. This co-operation is important since all site-related conditions do not get simulated on the first day of installation.

We also solicit your feedback on our products. It will greatly help us in fulfilling your requirements more accurately. We are sure you will get excellent performance from our systems and look forward to repeated orders from you.

We request you to read the chapter on "Precautions" before you start using our system.

With best wishes,

Signature:

Date:

TECHNICAL SPECIFICATION

SPECIFICATION FOR 1-500.0KVA SERVO CONTROLLED VOLTAGE STABILISER...

FEATURES:

The essential features of the voltage stabilizer shall be as under:

- High Accuracy and fast response.
- No waveform distortion.
- High Efficiency.
- Negligible internal impedance.
- Solid State Control.
- Auto/Manual Operation.
- All Indications on Front Panel

SERVO CONTROLLED VOLTAGE STABILISER:

Rating	: KVA
Input Voltage	: 380V to 460V AC. (Three phase)
Output Voltage	: 425VAC \pm 1%. (Three phase)
Supply frequency	: 47 -53Hz.
Output Regulation	: +/- 1%
Effect of Power Factor	: Nil
Speed of correction	: 35 volts per second.
Efficiency	: Better than 95%
Ambient Temperature	: 45 degrees Centigrade.
Duty Cycle	: Continuous.
Output Neutral terminal	: Separate terminal for input and output.
Cooling	: Air /Oil Cooled
Type of load	: unbalanced

CONTROLS AND INDICATIONS:

The voltage stabilizer shall be provided with the following controls and indications:

- Mains ON
- Auto/Manual Switch
- Raise/Lower pushbuttons for operation in manual mode.
- Voltmeter to read input and output voltages.
- Automatic Power cut off for under or over voltage.
- OTHERS AS PER P.O.

MODES OF OPERATION:

AUTO MODE:

The stabilizer is designed for and is suggested to be used in Auto mode. An operational amplifier senses the output and compares it with the reference level. The control card then automatically effects the corrective action with the help of a servo motor and variac to buck or boost the incoming voltage so as to get a well-regulated output.

MANUAL MODE:

The unit can also be used in manual mode for some special applications. In manual mode, output voltage can be raised or lowered by a spring action switch provided on the front panel. Any variation in output voltage due to load current or line variation can be corrected by using this switch in the event of failure of auto mode correction.

METERING

1 No. voltmeter with selector switch is provided for each section to read line to line & line to neutral voltages of input & output. A voltage selector switch is provided with positions 1 & 2 to read the input & output voltages respectively.

Also 1 No. of analog ammeter is provided with selector switch for each section to read load current in all phases.

OPERATING INSTRUCTIONS & CONTROL FUNCTIONS

1. Inward Inspection: The unit should be inspected as soon as it is received for transit damages. The major transit damages should be immediately reported. The unit should not be switched ON if the transit damage is of major nature.
2. Electrical connections: The unit is provided with input & output termination at the front side of the unit. Open the front door and connect suitable cables to input termination. Output shall be taken from output terminals.
3. Ventilation: Unit is designed for forced ventilation. However proper ventilation is necessary for continuous operation. Unit should be housed in such place where no heat waves are generated. The unit has a top closed construction with cooling fans mounted on its side panels. Inlet of all is from the base wire mesh. It is desirable to elevate the unit from ground to get proper air inlet in case of installation along with other panels. The regular cleaning of these mesh will maintain proper inflow and outflow of the cooling air.

Recommended cable size:

FOUR Core P.V.C. cable ---- sq .mm. Aluminum or sq. mm copper. For input as well as output.

GENERAL DESCRIPTION AND PRINCIPLE OF OPERATION

The SCVS in consideration basically consists of following power and control components.

1. Buck –Boost transformer.
2. Variac with AC Servo motor drive.
3. Solid state control card.
4. Output Contactor.

A three –phase supply is given to system through SFU/MCCB. The buck –boost transformer secondary is connected in series with supply, and the output is taken from another lead of secondary. The primary of buck-boost transformer receives variable voltage through servomotor driven variac connected across the same phase. The output voltage is sensed and with electronic and accordingly command is given to the motor to position the variac for giving corrected output voltage. The motor rotates in both the directions, reverse and forward. A little time delay is start with correction action to avoid the hunting due to surges and transients.

Output of the Stabilizer is isolated by means of a Contactor.

CONTROLS AND ITS OPERATIONS

The unit is shipped in ready to use condition. After installation, the unit can be switched ON and following procedure will help user to understand, and check various controls & indications.

1. Connect three phase 3 wire input power to input terminals. It is necessary to connect good earthing connection to the ground terminal as per the safety regulation. Switch ON the input supply by operating the ON/OFF switch or MCCB mounted on the front panel. The input ON and TRIP indication LED's will glow. After switching ON the servo Controlled Voltage stabilizer, the VOLTMETER will indicate corresponding voltage as selected by the selector switch.
2. Now put the voltmeter selector switch in input mode & measure the line voltages i.e., BR & YB phase respectively. Then put the selector switch in output voltage mode and measure the output voltages indicated by voltmeter.
3. Put the auto/manual switch in manual mode and vary the output voltage by pressing raise /lower switch in get desired variation. The output variation may be monitored by front panel voltmeter.
4. Put the Auto/Manual switch in AUTO mode. Now the servo motor control will start functioning. Keep the voltmeter selector switch in output position (i.e-2) the voltmeter on the front panel will show the output voltage. Now adjust the output set control potentiometer with the help of a screwdriver to set the output between 405to 425V AC now voltage stabilizer is ready for load connection. If the output changes, the Servo Controlled Voltage Stabilizer will correct the output voltage automatically. Now pressing O/p ON push button shall turn ON SCVS.

The trip is provided for the under & over voltage condition. The o/p voltage is sensed constantly with respect to the set voltage referance.in case of change in input voltage the servomechanism corrects the position of variac brush and adjusts the voltage accordingly. In case of voltage exceeds beyond range the output Contactor trips with time delay of approximately 8 to 10 seconds. The respective phase LED's will glow and all the phases shall be cut off by tripping output Contactor.

The overload trip occurs in case of instantaneous overload more than five times or continuous overload of 1.1 times of the rated load. Tripping characteristics is similar to that of fuses or MCB. In case of overload trip LED indications with trip shall be displayed on the front panel. In case of any trip, it is necessary to press a reset button, which will clear all the indications if an operating condition is within the parameters designed. Otherwise the respective LED's will not clear off. All indications will wipe off except the trip indication. The output ON push button shall be pressed to deliver the power to load. It is advisable to check the load circuit in case of overload before re-starting the stabilizer.

TROUBLE SHOOTING CHART

Fault	Observation	Remedy
Output Voltage not adjusting in either Auto or Manual mode	Output ON Trip indication glowing with mains ON. Sudden drop in output voltage after switching ON the load and unit trips.	Check carbon brush of the variac. Check if input voltage exceeds limit. If yes, wait unit input voltage restores within specified range.
Output voltage adjustable in Manual mode. But unit trips in Auto mode.	Output voltage not adjustable in Auto mode.	Change control card.
Servomotor is stalled at one Location.	Motor is hunting at one location and non-responsive to Auto/Manual control.	Change RC components of the motor or change control card.
Trips indications is glowing.	No other indication glowing on the front panel. No output is available.	Check the sensing transformer and change if fault. Check control card.
Output voltage not available	Output Contactor does not switch ON.	Check control fuses. Check following contacts: Relay in series with output Contactor coil and Off push button.
Output voltage not available	Output Contactor remains ON only while pressing the output ON push button.	Check Contactor coils. Check the HOLD ON auxiliary contact of Contactor coil.
Mains ON indication not glowing after connecting input supply.	No indications available on front panel. No output available.	Check input supply. Check if input MCB/MCCB is in ON condition. Check input fuses.
Output voltage not showing on voltmeter.	Output is available but not showing on meter.	Check meter if faulty. Check if Input/ Output voltage selector toggle switch if faulty.
Fault	Observation	Remedy

Output ammeter is not reading the current.	Output is available but load current not shown even with mains ON and output ON indication.	Check meter if faulty. Check output current feed back transformer.
Mains ON indication not glowing but supply in available.	Output is available with output ON indication.	Check indication LED if faulty, check indication PCB.
Output is tripping with Under Voltage/Over Voltage fault indication.	Meter-shown unhealthy Input Voltages. Indication is not cleared after pressing reset.	Check if input voltage is restored within specified range. Press reset push button & output ON.
	Meter shown healthy input voltage but reselecting is not possible.	Check reset push button. Check control card.
	Servo Motor not working in Auto/Manual mode.	Check servomotor and RC of the motor. Check variac for mechanical problems.
'Reset' is not functioning	Mains ON indication with output Over Voltage/Under Voltage indication.	Check reset P/B check Over Voltage/Under Voltage relay. Check control card.

APPENDIX- A

APPENDIX A-1
TEST CERTIFICATE

System Description : TRUE-ON-LINE UPS/SCVS
Serial Number :
Rating :
Buyer :

(Quality Control Department)

(Production Department)

Date:

(Company Seal)

APPENDIX

WARRANTY CERTIFICATE

System Description : **SERVO CONTROLLED VOLTAGE STABILIZER.**

Serial Number :

Rating : **KVA Air /OIL COOL.**

Buyer :

This unit is warranty against all manufacturing and workmanship defects up to a period of 12 months from the date commissioning or 13 months from the date of supply, whichever is earlier.

This warranty is valid only if the unit to its electrical, mechanical and environmental specification and no consequential damage are accepted under this warranty.

(Quality Control Department)

(Production Department)

Date: 17/06/09

Company Seal

APPENDIX A-3
REPLYCARD

System Description : TRUE-ON-LINE UPS/SCVS
Serial Number :
Rating :
Date of Dispatch :

Client Information

Name :
Address :
Contact Person :
Department :
Phone (with STD Code) : Fax:

Dealer's Information

Name :
Address :
Contact Person :
Department :
Phone (with STD Code)

GALAXY ELECTRONICS (INDIA) INC.
LIST OF REGIONAL OFFICES / SERVICE CENTERS

SR.	LOCATION	PHONE (S)	FAX (STD
1.	PUNE (Sales& HO)	40084939	020-40084939
2.	MUMBAI	25791800 25790461	022-25774087
3.	DELHI	55705321 39548589	011-22022087
4.	HYDERABAD	27051318	040-27069029
5.	AHAMDABAD	079-25451577	

HELP LINE EMAIL: manager@galaxyups.com