NUMERIC Volt Safe Plus Single Phase Servo Stabilizer User Manual

Contents

NUMERIC®

NUMERIC Volt Safe Plus Single Phase Servo Stabilizer

Specifications

Capacity (kVA)	1	2	3	5	7.5	10	15	20
GENERAL								
Operation	Automatic							
Cooling	Natural / Forced air							
Ingress protection	IP 20							
Insulation resistance	> 5M at 500 VDC as per IS9815							
Dielectric test	2kV RMS for 1 minute							
Ambient temperature	0 to 45 °C							
Application	Indoor use / Floor mounting							
Acoustic noise level	< 50 dB at 1 meter distance							
Colour	RAL 9005							
Standards	Conforms to IS 9815							
IP/OP-Cable entry	Front side / Rear side							
Door lock	Front side							
Generator compatability	Compatible							
INPUT								
Voltage range	Normal – (170 V~270 V +1% AC); Wide – (140~280 V + 1% AC)							
Frequency range	47 ~ 53 ± 0.5% Hz							
Correction speed	27 V/sec (Ph-N)							
OUTPUT								
Voltage	230 VAC + 2%							
Waveform	True reproduction of input; no waveform distortion introduced by stabilizer							
Efficiency	> 97%							
Power factor	Immune to load PF							
Protection	Neutral failure							
	Frequency cut off							
	Surge arrester							
	Input: Low-High & Output: Low-High							
	Overload (Electronic trip) / Short circuit (MCB/MCCB)							
	Carbon brush failure							
PHYSICAL								

Dimensions (WxDxH) mm (±5mm)	238x320x300	285x585x325	395x540x735	460x605x855		
Weight (kgs)	13-16	36-60	70 – 80	60-100	100-110	130-150
LED digital display	TRUE RMS measurement					
	Input voltage					
	Output voltage					
	Output frequency					
	Load current					
Front panel indications	Mains ON, Output ON, Trip indications: Input low, Input high, Output low, Output high, Overload					

Product Usage Instructions

Introduction

1. **Features:** The VOLTSAFE PLUS is a single-phase servo stabilizer with capacities ranging from 1 to 20 kVA. It operates automatically and provides efficient voltage correction.
2. **Principle of Operation:** The stabilizer ensures a stable output voltage by continuously monitoring and adjusting the input voltage fluctuations.
3. **Block Diagram:** The block diagram illustrates the input and output connections of the servo stabilizer.

Important Safety Instructions

General Safety Precautions: To prevent hazards, avoid installing the stabilizer in areas with flammable materials or near gasoline-powered machinery.

Installation

- **Installation Procedure:** Follow local electrical codes and standards during installation. Connect the electrical cable to the designated output socket or terminal block.
- **AC Safety Grounding:** Ensure proper grounding by connecting the earth wire to the chassis earth point terminal.

Specifications

The detailed specifications of the VOLTSAFE PLUS servo stabilizer are outlined above.

PREFACE

- Congratulations, we are delighted to welcome you to our family of customers. Thank you for choosing Numeric as your reliable power solution partner; you now have access to our widest network of 250+ service centers in the country.
- Since 1984, Numeric has been enabling its clients to optimize their businesses with top-notch power solutions that promise seamless and clean power with controlled environmental footprints.
- We look forward to your continued patronage in the years to come!

- This manual provides general information regarding installation and operation of VOLTSAFE PLUS.

Disclaimer

- The contents of this manual are bound to change without prior notice.
- We have exercised reasonable care to give you an error-free manual. Numeric disclaims liability for any inaccuracies or omissions that may have occurred. If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.
- Before you begin the installation of the servo voltage stabilizer, please read this manual thoroughly. The warranty of this product is null and void, if the product is abused/misused.

Introduction

Numeric VOLTSAFE PLUS is a servo-controlled voltage stabilizer with advanced microprocessor-based technology to stabilize line of AC power system. This stabilizer is an electronic equipment which gives a constant output voltage from fluctuating input AC voltage and varying load conditions. VOLTSAFE PLUS produces a constant output voltage with ±2% accuracy of the set voltage.

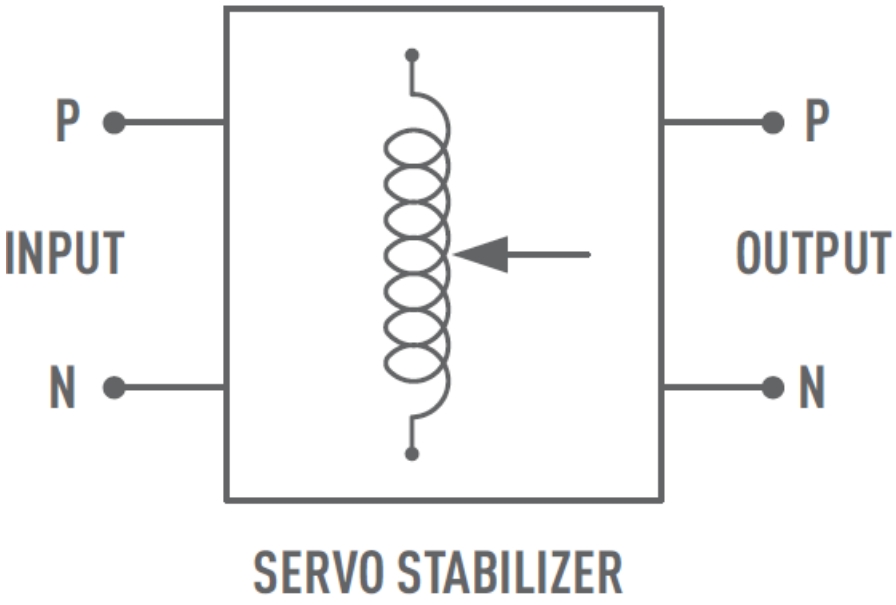
Features

- Seven segment digital display
- Advanced MCU-based technology
- High efficiency and reliability
- Generator compatible
- In-built SMPS technology
- No waveform distortion
- Overload cut-off
- Power loss less than 4%
- Continuous duty cycle
- Provides audible buzzer warning for faulty / trip conditions
- Visual LED indication for trip indications & mains ON
- Extended life
- High MTBF with low maintenance

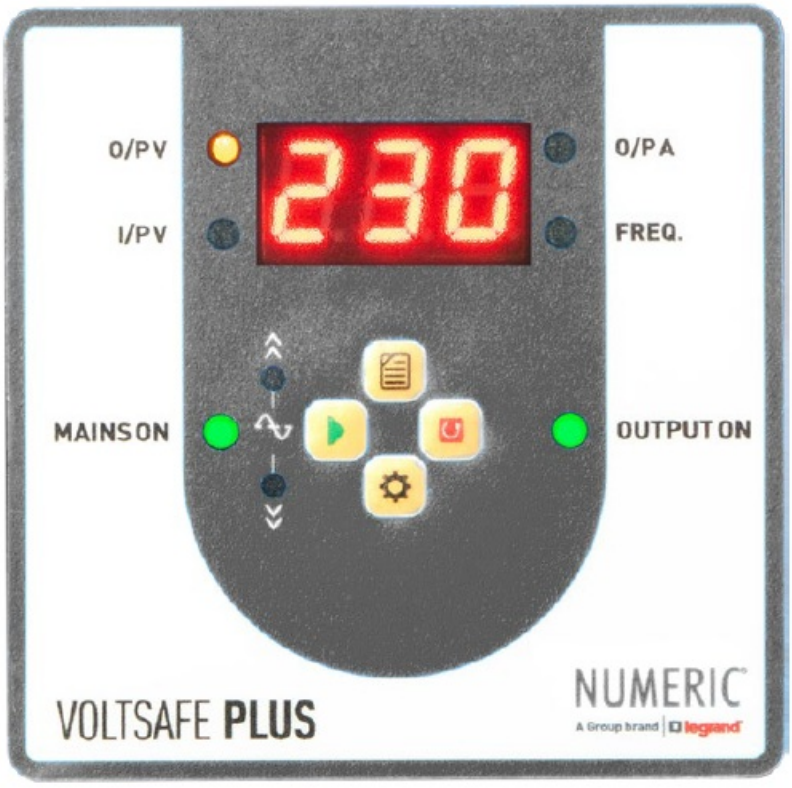
Principle of operation

- VOLTSAFE PLUS uses a closed-loop feedback system to monitor the input and output voltages and to correct the varying input voltage. The constant output voltage is achieved by using a variable autotransformer (variac) with an AC synchronous motor and an electronic circuit.
- The microcontroller-based electronic circuit senses the voltage, current and frequency and compares it with a reference. In case of any deviation in input, it generates a signal that energizes the motor to vary the voltage and correct the output voltage within the said tolerance. The stabilized voltage is supplied for the AC loads only.

Block diagram
VOLTSAFE PLUS – Servo 1 Phase – 1 Phase: Servo Stabilizer block diagram.

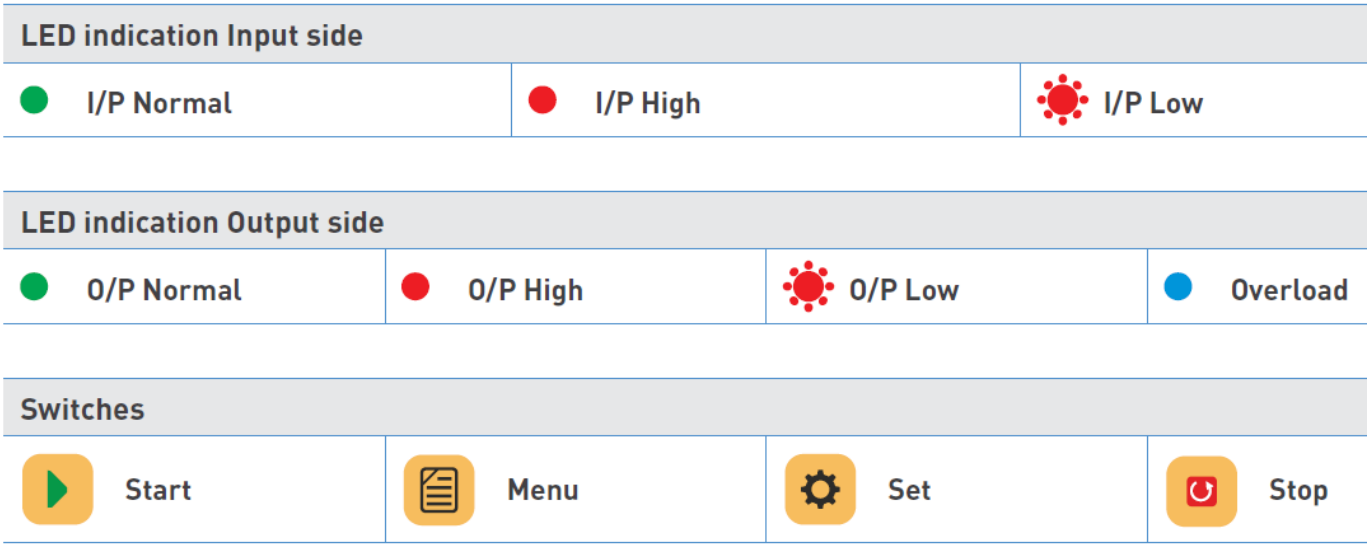


Front panel operations & LED indication



Digital meter selection indication	
I/P V	Display meter selection indication for input volts
O/P V	Display meter selection indication for output volts
FREQ	Display meter selection indication for output frequency
O/P A	Display meter selection indication for output load current

Menu switch			
Input volts	**Output volts**	**Output load current**	**Output frequency**



Dos and Don’ts – Operations

- **Dos**
  - For all single phase servo stabilizers, it is recommended to only connect the neutral and any one phase only.
  - Ensure that there is no loose connection.
- **Don’ts**
  - Input line & Output line should not be interchanged in single phase connection.
  - At the site, do no connect phase to phase at input side of the servo, under any circumstance. Only neutral to phase is to be connected.

Important safety instructions

General safety precautions

- Do not expose the stabilizer to rain, snow, spray, bilge or dust.

- To reduce the risk of hazard, do not cover or obstruct the ventilation openings.
- Do not install the stabilizer in a zero-clearance compartment which may result in overheating.
- To avoid the risk of fire and electronic shock, make sure that the existing wiring is in good condition and the wire is not under-sized.
- Do not operate the stabilizer with damaged wiring.
- This equipment contains electronic components which can produce arcs or sparks. To prevent fire or explosion, do not install it in compartments containing batteries or flammable materials or at locations that require ignition protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks or joints, fittings, or other connections between components of the fuel system.

IMPORTANT SAFETY WARNING

- As dangerous voltages are present within the servo-controlled voltage stabilizer, only Numeric technicians are permitted to open it. Failure to observe this could result in the risk of an electric shock and invalidation of any implied warranty.
- As servo stabilizer has got moving parts like variac arm and motor, please keep it in a dust-free environment.

Installation

Installation procedure

- Unpack the unit carefully without damage since the packaging of the equipment has a carton along with a foam packed enclosure, depending on the case. It is recommended to move the packed equipment till the installation area and unpack it later.
- The unit must be placed at an adequate distance from the wall and proper ventilation needs to be ensured for continuous operation. The unit should be installed in a dust free environment and at a place where no heat waves are generated.
- If the servo unit has a 3-pin power input cable, connect it to a 3-pin [E, N & P] Indian plug or a 16A Indian socket to the 1-pole main breaker switch, in accordance with local electrical codes and standards.
- In other models, where the servo has a connector or terminal board, connect the marked input and output respectively from the terminal board.
  Note: Do not interchange the single phase Input – L & N.
- Switch ON Main MCB
  Note: Input & Output MCB is an optional accessory as per the customer’s requirement for air-cooled single-phase servo stabilizers.
- Before connecting the load, check output voltage in the display meter provided in the front panel.
- It should be within the desired set voltage of ± 2%. Verify the output voltage displayed on the digital meter in the front panel. Ensure the servo stabilizer is working properly.
- Switch OFF Main MCB before connecting the load.
- Connect the single phase output to one end of the output rated electrical cable from the load, in accordance with local electrical codes and standards. Connect the other end of the electrical cable to the output Indian UNI socket or terminal block marked ‘OUTPUT’.

AC safety grounding

Earth wire should be connected with the chassis earth point terminal of the unit.

WARNING! Make sure all the AC connections are tight (torque of 9-10ft-lbs 11.7–13 Nm). Loose connections could result in overheating and a potential hazard.

BYPASS Switch – Optional
Note: Product specifications are subject to change purely on company's discretion without any prior notice.

SCAN TO FIND OUR NEAREST BRANCH

Head Office: 10th Floor, Prestige Center Court, Office Block, Vijaya Forum Mall, 183, N.S.K Salai, Vadapalani, Chennai – 600 026.

Contact our 24×7 Customer Excellence Centre:

- **Email:** customer.care@numericups.com
- **Phone:** 0484-3103266 / 4723266
- www.numericups.com

FAQ

Q: Can the VOLTSAFE PLUS servo stabilizer be used outdoors?
A: No, the stabilizer is designed for indoor use only.

Q: What is the power factor of the stabilizer?
A: The stabilizer has a power factor greater than 97%.

Q: How do I know if there is an overload?
A: The stabilizer has overload protection with electronic trip functionality.

Documents / Resources

	NUMERIC Volt Safe Plus Single Phase Servo Stabilizer [pdf] User Manual Volt Safe Plus Single Phase Servo Stabilizer, Single Phase Servo Stabilizer, Phase Servo Stabilizer, Servo Stabilizer

References

- **User Manual**