NUMERIC 200 Voltsafe Plus Three Phase Air Cooled Instruction Manual

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Contents

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 centres 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.

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 ±1% accuracy of the set voltage.

Features

- Alpha-numeric LCD display metering for each phase
- Advanced MCU-based technology
- High efficiency and reliability
- Generator compatible
- No waveform distortion
- Correction speed – 50 V/sec
- Response time < 20 ms
- Immune to load PF and supply frequency variations
- Power loss less than 4%
- Continuous duty cycle
- Provides audible buzzer warning for faulty/trip conditions
- Extended life

- High MTBF with low maintenance

Principle of operation

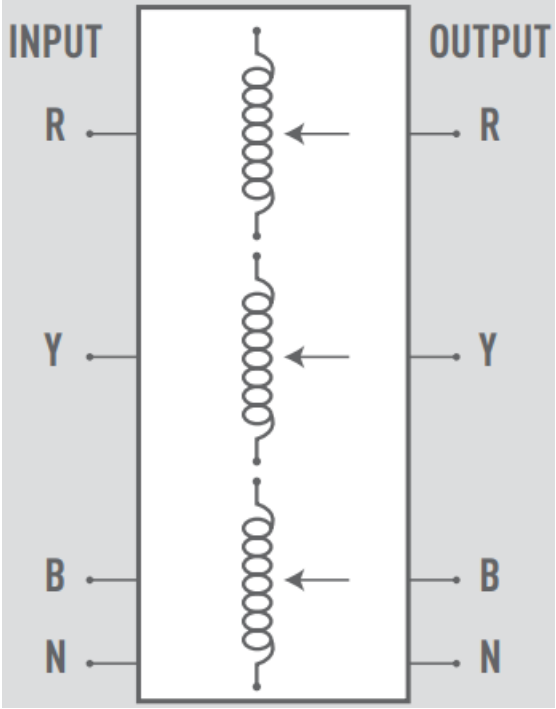
VOLTSAFE PLUS uses a closed-loop feedback system to monitor the input and output voltages and to correct the varying input voltage. The constant output voltage is achieved by using a variable autotransformer (variac) with AC synchronous motor, buck-boost transformer, and an electronic circuit. Microcontroller-based 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 which energizes the motor to vary the voltage and correct the output voltage within the said tolerance, with the help of the buck-boost transformer.

Cooling system:
AN/AF- Air Natural /Air Forced – cooling system is used for 3 Phase Air cooled stabilizers.

Block diagram

3 Phase – 3 Phase
Servo Stabilizer without Isolation Transformer

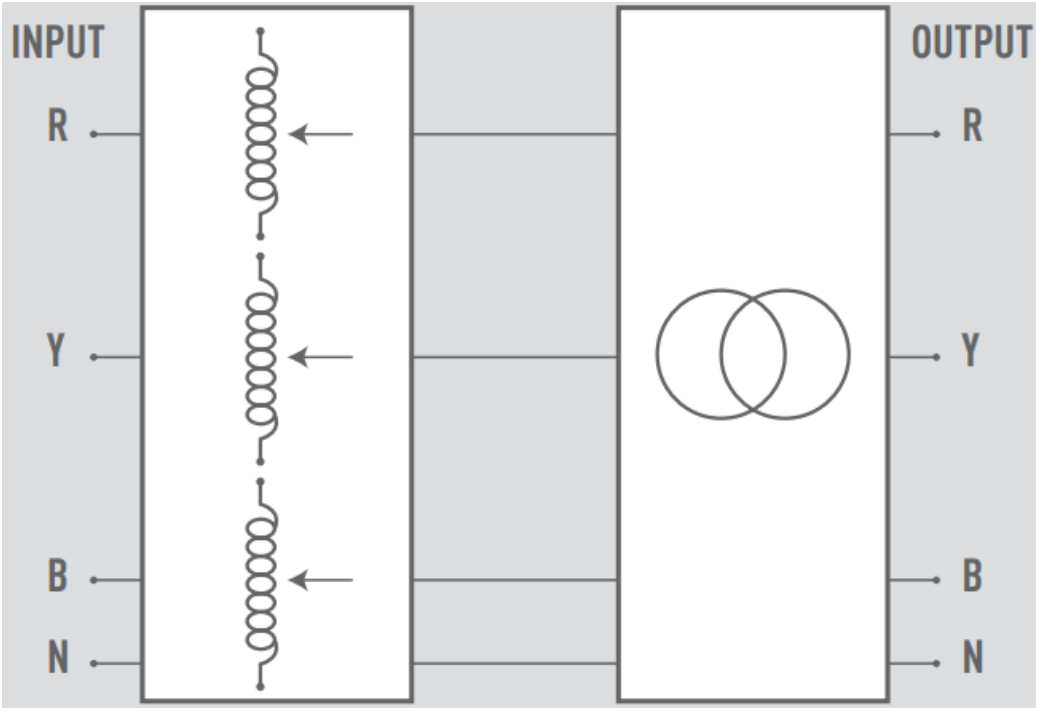
VOLTSAFE PLUS – SERVO



SERVO STABILIZER

3 Phase – 3 Phase
Servo Stabilizer with Isolation Transformer

VOLTSAFE PLUS – ISO SERVO



SERVO STABILIZER / ISOLATION TRANSFORMER

Front panel operations

MENU	Use for **MENU** switch LCD display mode selection.
START	Use for **START** switch initial time delay release. Trip release for output over-voltage, output under-voltage, input over-voltage and input under-voltage for each phase.
STOP	Use for **STOP** switch to break the Output.
LOG	Use for **LOG** switch to check the failure & Trip details.

Digital metering			
Input voltage (for each phase)	**Output voltage** (for each phase)	**Frequency** (for each phase)	**Load current** (for each phase)

Fault message display in LCD			
Phase fail / Trip status indication	**Input under-voltage / over-voltage**	**Output under-voltage / over-voltage**	**Output overload**

Dos and Don’ts – Operations

Dos

 Provide proper connection and ensure that there is no loose connection.

Don’ts

 Input RYB / N & Output RYB / N should not be interchanged in 3 Phase connection.

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 in compartments containing batteries or flammable materials or in 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 wooden pallet, cardboard or wooden packed enclosure depending on the case, it is recommended to move the equipment packed till the installation area and later unpack it.
- Unit must be placed with adequate distance from the wall & proper ventilation is necessary for continuous operation. Unit should be housed in such a place where no heat waves are generated and has a dust free environment.
  Note: It is mandatory that the Mains AC line supplying the stabilizer includes input protection.
- Open the door lock using lock key. Connect the 3 Phase supply to one end of the input rated electrical cable from the 3 pole Main Breaker switch in accordance with local electrical code and standards.
- Connect the other end of the electrical cable to the terminal connector/SMC terminal in the front end marked 'INPUT'.
  Note: Do not interchange the 3 Phase input – R, Y, B & N.
- Switch ON Main MCB/MCCB
  Note: Input & Output MCB /MCCB as an optional accessory against customer requirement for air cooled 3 phase servo stabilizers.
- Check the output voltage in the display meter provided in the front panel. It should be within the desired set voltage of ±1%. Verify the output voltage displayed on the digital meter in the front panel. Ensure the servo stabilizer is working properly.
- Switch OFF Main MCB/MCCB before connecting the load.
- Connect 3 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 terminal connector/SMC terminal in the front panel marked 'OUTPUT'.
- Keep the ROTARY/MANUAL change-over switch in 'SERVO' position.
  Note: ROTARY/MANUAL change-over switch as an optional accessory against customer requirement for Air cooled 3 phase servo stabilizers.

AC safety grounding

The AC Input /Output earth wire should be connected to ground point for the loads and the other end should be connected to chassis terminal of the unit.

WARNING!

Ensure that all AC connections are tight (torque to 9 – 10 ft-lbs, 11.7 – 13 Nm).
Loose connections could result in overheating, posing a potential hazard.

Specifications

Capacity (kVA)	10	15	20	30	40	60	80	100	125	150	200
GENTRAL											

Control	Digital (MCU-based design)
Drive	AC synchronous motor control
Operation	Automatic
Cooling	Natural / Forced air
Ingress protection	IP20
Insulation resistance	>5 M at 500 VDC as per IS9815 Standard
Dielectric test	2 kV 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 IS9815
IP/OP – Cable entry	Frontside
Door lock	Frontside
Generator compatibility	Compatible
INPUT	
Voltage range*	Normal (340 VAC ~ 480 VAC) / Wide (310 VAC ~ 480 VAC)
Frequency range	47 ~ 53 ± 0.5% Hz
Correction Speed	50 V/sec (Ph – Ph)
OUTPUT	
Voltage	415 VAC
Waveform	True reproduction of input; no waveform distortion introduced by stabilizer
Efficiency	> 97%

Power factor	Immune to load PF										
Protections**	Single phase prevention and cut-off										
	Neutral failure										
	Frequency – Low/High cut-off										
	Phase failure										
	Surge arrester										
	Input : Low/High & Output : Low/High cut-off										
	Overload – Electronic trip / Short circuit (MCB/MCCB trip)										
	Carbon brush failure										
	Phase reversal trip										
PHYSICAL											
Dimensions (WxD xH) in mm (+/- 5 mm)	375 x 465 x 850	375 x 615 x 850		375 x 625 x 935		545 x 1025 x 1390			635 x 1135 x 1510		
Weight (kgs)	60	100	120	140	160	180	290	330	400	470	580
Display type	LCD										
Display parameters	Input voltage (Line-Line & Line-Neutral) each phase										
	Output voltage (Line-Line & Line-Neutral) each phase										
	Load current (Line-Neutral)										
	Output frequency										
Events	Fault annunciation										
Input / Output terminations	Terminal board provided										

*Range can be customised as per requirement,
** Input MCB/MCCB & manual bypass is optional
Note : Product specifications are subject to change purely on company's discretion without any prior notice.

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.

Support

Head Office
10th Floor, Prestige Center Court,
Office Block, Vijaya Forum Mall, 183,
N.S.K Salai, Vadapalani,
Chennai – 600 026.
Phone: +91 44 4656 5555

Regional Offices

New Delhi
B-225, Okhla Industrial Area,
4th Floor, Phase-1,
New Delhi – 110 020.
Phone: +91 11 2699 0028

Kolkata
Bhakta Tower, Plot No. KB22,
2nd & 3rd Floor, Salt Lake City,
Sector – III, Kolkata – 700 098.
Phone : +91 33 4021 3535 / 3536

Mumbai
C/203, Corporate Avenue, Atul Projects,
Near Mirador Hotel, Chakala,
Andheri Ghatkopar Link Road,
Andheri (East), Mumbai – 400 099.
Phone : +91 22 3385 6201

Chennai
10th Floor, Prestige Center Court,
Office Block, Vijaya Forum Mall,
183, N.S.K Salai, Vadapalani,
Chennai – 600 026.
Phone : +91 44 3024 7236 / 200

Branch Offices

Chandigarh
SCO 4, First Floor, Sector 16,
Panchkula, Chandigarh – 134 109.
Phone : +91 93160 06215

Dehradun
Unit-1 and 2, Chakrata Road,

Vijay Park Dehradun – 248001.
Uttrakhand
Phone : +91 135 661 6111

Jaipur
Plot No. J-6, Scheme-12B,
Sharma Colony, Bais Godown,
Jaipur – 302 019.
Phone : +91 141 221 9082

Lucknow
209/B, 2nd Floor, Cyber Heights,
Vibhuti Khand, Gomti Nagar,
Lucknow – 226 018.
Phone : +91 93352 01364

Bhubaneswar
N-2/72 Ground Floor, IRC Village,
Nayapally, Bhubaneswar – 751 015.
Phone: +91 674 255 0760

Guwahati
House No 02,
Rajgarh Girls High School Road
(Behind Rajgarh Girls High School),
Guwahati – 781 007.
Phone : +91 361 245 0322/96000 87171

Patna
405, Fraser Road, Hemplaza,
4th Floor, Patna – 800 001.
Phone : +91 612 220 0657

Ranchi
202 & 203, 2nd Floor, Sunrise Forum,
Bardwan Compound, Lalpur, 2nd Floor,
Ranchi – 834 001.
Phone : + 91 98300 62078

Ahmedabad
A-101/102, Mondeal Heights,
Beside Hotel Novotel, Near Iscon Circle,
S G Highway, Ahmedabad – 380 015.
Phone : +91 79 6134 0555

Bhopal
Plot No. 2, 221, 2nd Floor, Akansha Complex,
Zone-1, M.P.Nagar, Bhopal– 462 011.
Phone : +91 755 276 4202

Nagpur
Plot.No.174, H.No.4181/C/174, 1st Floor,
Loksewa Housing Society, Near Dr. Umathe
& Mokhare College, Bhamti Road,
Lokseva Nagar, Nagpur – 440 022.

Phone : +91 712 228 6991 / 228 9668

Pune
Pinacle 664 park avenue, 8th floor,
Plot no 102+103, CTS No. 66/4,
Final, 4, Law College Rd, Erandwane,
Pune, Maharashtra – 411 004.
Phone : +91 98225 36680

Bengaluru
No-58, First Floor, Firoze White Manor,
Bowring Hospital Road,
Shivajinagar, Bangalore -560 001.
Phone : +91 80 6822 0000

Coimbatore
No. B-15, Thirumalai Towers, No. 723,
1st Floor, Avinashi Road, Coimbatore – 641 018.
Phone : +91 422 420 4018

Hyderabad
Prestige Phoenix Building,
1st Floor, Survey no. 199,
No. 6-3-1219/J/101 & 102, Uma Nagar,
Opposite to Begumpet Metro Station
Begumpet 500016
Phone: +91 40 4567 1717/2341 4398/2341 4367

Kochi
Door No. 50/1107A9, JB Manjooran Estate,
3rd Floor, Bypass Junction,
Edappally, Kochi – 682 024.
Phone : +91 484 6604 710

Madurai
12/2, DSP Nagar,
Dinamalar Avenue,
Madurai – 625 016.
Phone : +91 452 260 4555

Customer Support

Sales – enquiry.numeric@numericups.com
Service – support.numeric@numericups.com
Contact us.: 0484-3103266 / 4723266 www.numericups.com

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Documents / Resources

	NUMERIC 200 Voltsafe Plus Three Phase Air Cooled [pdf] Instruction Manual 200 Voltsafe Plus Three Phase Air Cooled, 200 Voltsafe, Plus Three Phase Air Cooled, Three Phase Air Cooled, Phase Air Cooled, Air Cooled, Cooled

References

- Home | Numeric UPS
- User Manual