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سيجما للصناعات الإلكترونية

TURBO Series Servo Stabilizers

Single Phase Servo Stabilizers

User's Manual

Index

Micro Controlled Line Stabilizers

TURBO Series of Single Phase Servo Stabilizers provide un-paralleled performance and reliability in voltage correction systems, with their outstanding features and design. They are built ruggedly to work reliably in any environment and are so compact.

TURBO Series of Single Phase Servo Stabilizers provides state of the art display through a single LCD for easier user interface.

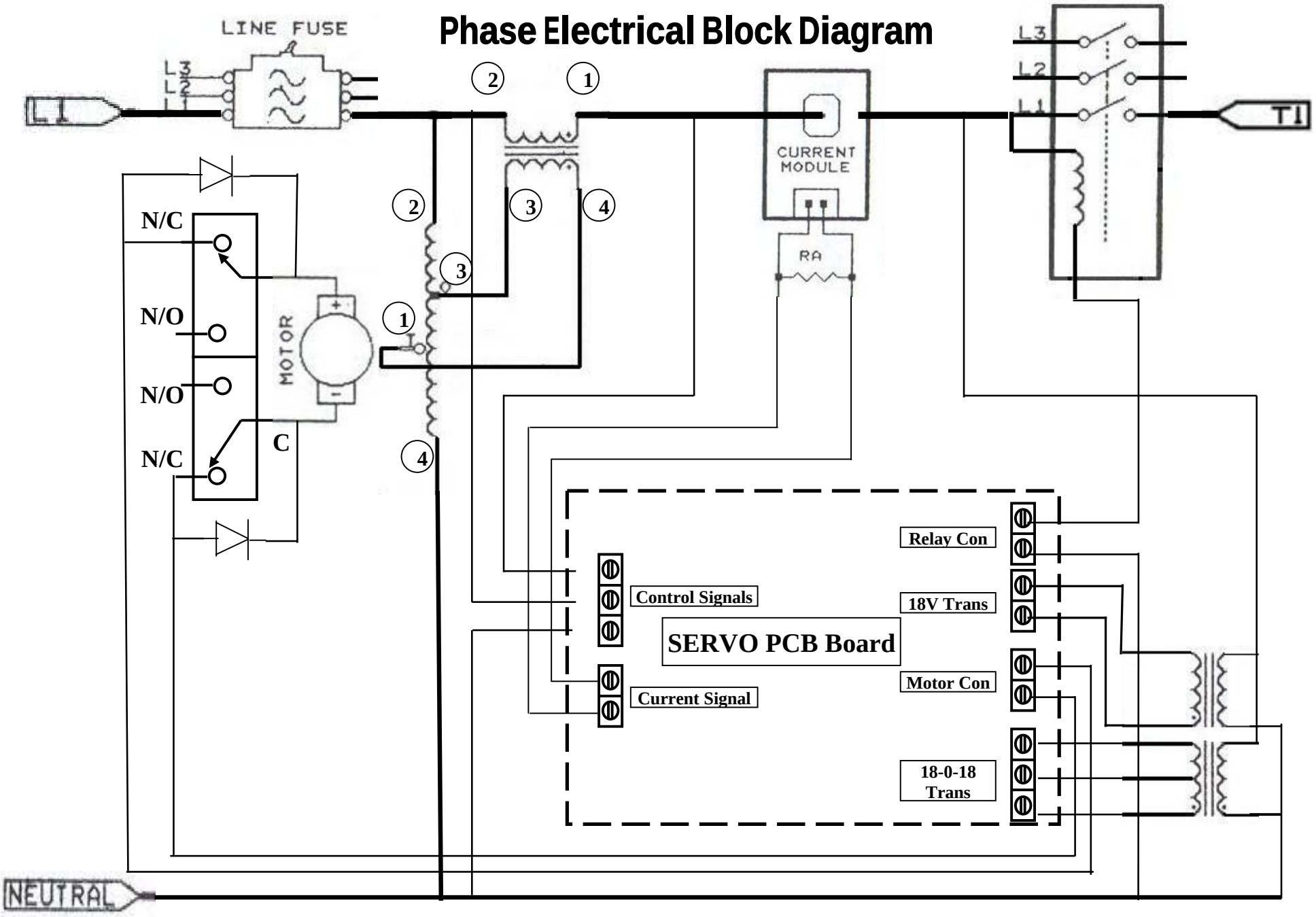
General Specifications:-

- True RMS Input/Output Measurements.
- Micro Controlled System.
- 80v/Sec Dynamic Regulations Speed.
- 1% Static Regulation.
- Electronic Overload and Over/Under Voltage Protection.
- Load Level, Output Voltage, Input Voltage LCD Display.
- Programmable Low and High Level Voltage Protection.
- Wide Range Correction Operating Area 160 – 250 VAC
- Programmable Output Voltage.

Technical Specifications

Input Voltage Range	:	160 – 250 VAC RMS
Output Voltage	:	220 VAC ± 1.5%
Output Voltage Adjustment	:	± 5 %
Operating Frequency	:	50 Hz ± 5%
Overloading	:	10 Sec, > 150% Load
Regulation Speed	:	~80VAC / Sec
Efficiency	:	> 98%
Operating Technique	:	PWM controlled DC motor by microcontroller
User Interface	:	LCD Display + 3 Buttons + 3 LEDs
Warnings	:	Input High/Low, Output outside ± 1% , Overload
Alarms	:	Output O.V/U.V, Overload (after Timer)
Measurement Values	:	Input/Output Voltage, Output Current
Output Protection	:	Short Circuit, Overload, Over/Under Voltage
Input Protection	:	Over Voltage, Over Current Thermal Protection
Operating Temperature	:	-10°C to 50°C
Humidity	:	95%
Operating Altitude	:	< 2000 mt.
Noise Level	:	< 50 db at 1 mt.

Phase Electrical Block Diagram



Line Stabilizer User Instructions

Instructions about Installation

1- Input and Output Power Cable Connections must have correct Cross Section to carry the Full Load Current

2- For Air Circulation, there must be adequate empty space around the stabilizer for safety and heat flow.

3- Ground Line must be always connected to the case of the stabilizer for safety.

4- Read Carefully the Operating Procedure before the installation of the Line Stabilizer.

Make the Following Works in Row

1- Connect the Input Power Cable to the Input of the Line Stabilizer

2- Connect the Input Circuit Breaker

3- Check if Phase Rotation exists; rewire Input Power Cable till correct sequence occurs.

4- On the Front Panel, Select the Desired Output Level and configuration

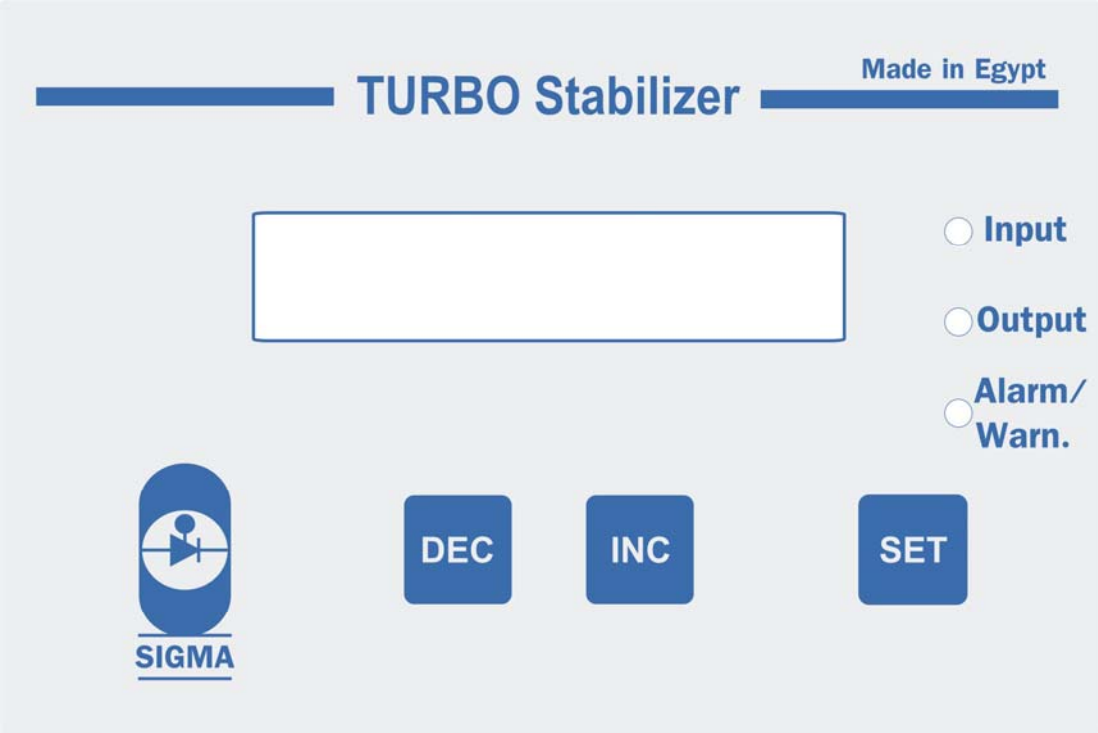
5- Disconnect the Input Circuit Breaker

6- Connect the Output Power Cable to the Output of the Line Stabilizer

7- Connect the Input Circuit Breaker

8- Check Output Power Cable is connected in the correct sequence for correct load operation, else rewire Output Power Cable .

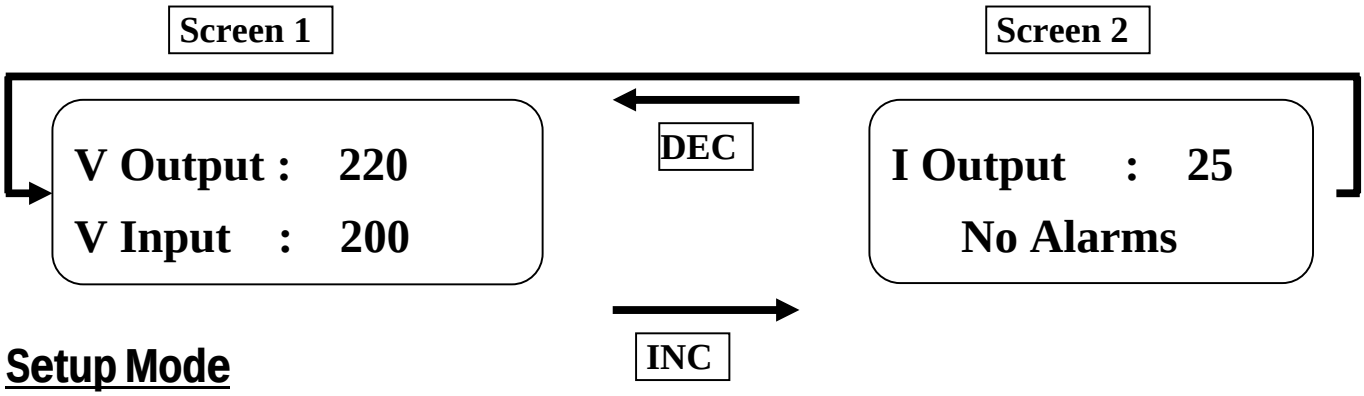
Front Panel User Instructions



	Control / Monitor		Function
Control	SET	**SET Button**	Enter Setup Mode to adjust VoNominal & OV/UV Limits
	INC	**INC Button**	Increment Page in Display Mode Increment Value in Setup Mode
	DEC	**DEC Button**	Decrement Page in Display Mode Decrement Value in Setup Mode
Monitor		**INPUT LED**	Valid Input and stabilizer Ready
		OUTPUT LED	Appropriate O/P exists and Output Contactor is ON
		Alarm/Warn LED	Flashes with Warnings and solid illumination for Alarms

Display Mode

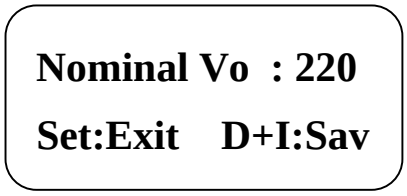
Displays: Input Voltage, Output Voltage , Output Current , Warnings .
- Navigate through pages by INC & DEC Buttons.
- Press SET Button to enter Setup Mode.



Setup Mode

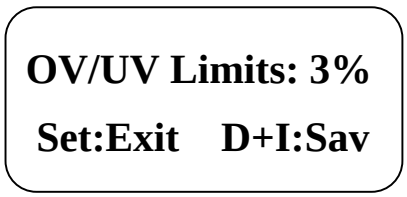
Used to adjust the desired Output Voltage (VoNominal), and to adjust Over Voltage / Under Voltage Limits (OV/UV Limits) where the stabilizer would disconnect for protection.

VoNominal Setup:-



- Use DEC & INC Buttons to loop from 210 to 230 VAC as desired
- Press DEC + INC (D+I) Buttons to save the desired value and exit Nominal Vo Setup
- Press SET Button to exit Vo Setup Page without save and enter OV/UV Limits Page

OV/UV Limits Setup:-



- Use DEC & INC Buttons to loop from 3% to 5% as desired
- Press DEC + INC (D+I)Buttons to save the desired value and exit OV/UV Limits Setup
- Press SET Button to exit OV/UV Limits Setup Page without save and enter Display Mode

Warnings :-

On Warning situation, TURBO Stabilizer continues operation with a buzzer and Warning LED flashing, following are warnings issued from TURBO Stabilizer:-

Vi Under Limit : Vi Under Limit Warning, when Vi is below 160VAC

Vi Over Limit : Vi Over Limit Warning, when Vi is over 250VAC

Vo Under Normal: Vo Under Normal Warning, when Vo goes below of VoNominal - 1%

Vo Over Normal : Vo Over Normal Warning, when Vo goes above of VoNominal + 1%

Io OverLoad : Io Over Loading Warning, when Io goes above Full Load current

Motor Error : Motor Error Warning, when Motor or Motor driver circuit failure occurs

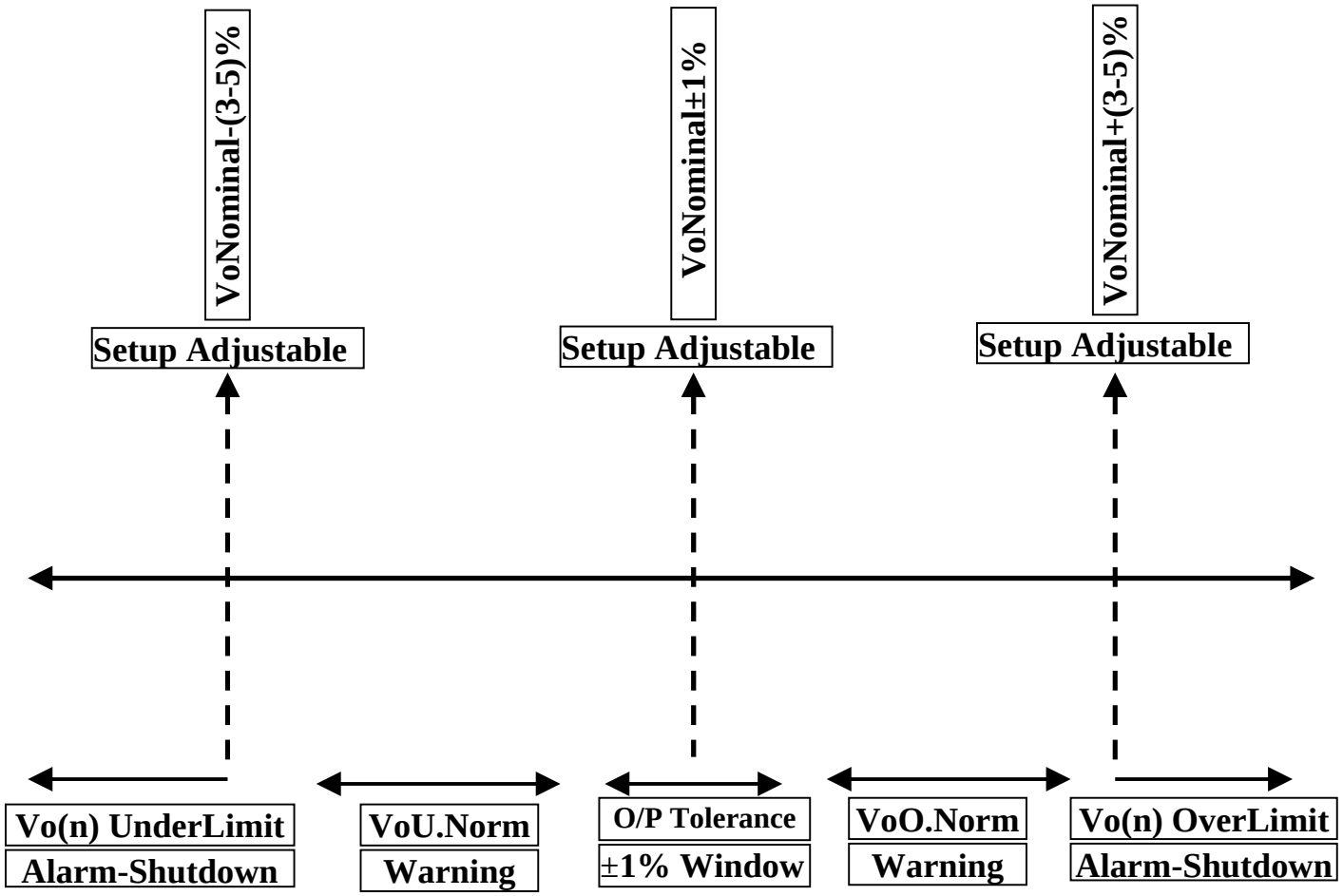
Alarms :-

On Alarm situations, TURBO Stabilizer disconnects O/P Contactor to protect the load from fault and abnormal conditions, following are alarms issued by TRBO Stabilizer:-

Vo Over Limit : Vo goes Over O/V limit (VoNominal + O/VLimit%)

Vo Under Limit : Vo goes Under U/V limit (VoNominal – U/VLimit%)

Io Over Limit : Io Overloading for a period beyond the programmed tripping curve
(Tripping Table in Page10)



OverLoad Tripping Curve	
Percentage Overload	**Time**
100% - 110%	5Min , 15 Sec
110% - 120%	4 Min , 15 Sec
120% - 130%	3Min , 14Sec
130% - 140%	2 Min , 12 Sec
140% - 150%	1 Min , 11 Sec
above 150%	10 Sec

Maintenance Procedure

1- Switch "OFF" Input Circuit Breaker.

2- Disconnect input/output terminals.

3- Open the covers of the line stabilizer and clean with air compressor the dust carefully.

4- Clean the variable transformer "VARIAC" wheel brush carefully.

5- Check the belt frame system, if there's a mechanical loose, please tighten properly.

6- Check the micro switches on the variable transformer "VARIAC", if there's a failure in their ON-OFF action, please replace.

7- Check all mechanical cable connections and Ground-Case connections for safety.

8- Check Power Supply Fuse, replace if blown

9- Check the electronic Control PCB connections and tighten the connectors.

10- Connect Input terminals and recheck the line stabilizer input/Output voltages and variable transformer brush movement.

11- Reconnect Output Load terminals upon success.

Note: Please only experienced maintenance technicians are allowed to follow this steps.