

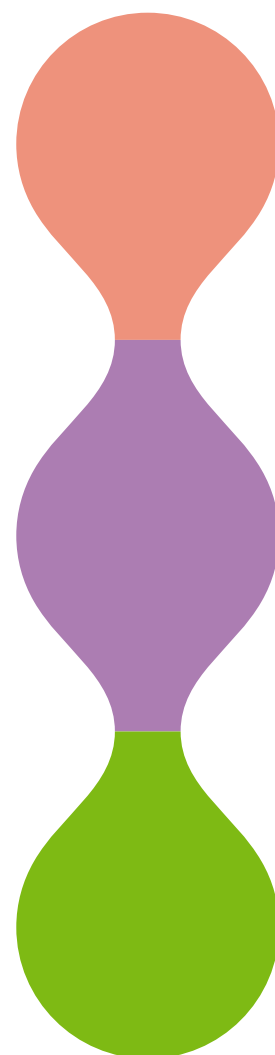


User Guide

Auto Voltage Regulator

PVS Series
(Single Phase 1-10KVA)

PVS III Series
(Three Phase 6-100KVA)



Version 1.00
(English)

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1. INTRODUCTION

PVS/PVS III series Servo Motor Control Voltage Regulator is an automatic voltage stabilizing device designed to maintain constant output voltage despite fluctuations in the input supply. It achieves this by using a servo motor coupled with a variable autotransformer (Variac) and a buck-boost transformer, providing precise voltage regulation with a tolerance as low as $\pm 3\%$.

1.1 Key Features

- Controller based technology for efficient servo motor operation, reducing unnecessary movements and wear
- Fast correction speed ensures quick response to voltage fluctuations
- Time delay function eliminates transient that can affect connected equipment
- Output voltage stability within $\pm 3\%$, protecting sensitive electronic and electrical equipment
- Suitable for use with generators and fluctuating power sources to improve system efficiency
- Isolation transformer integration for enhanced safety and equipment protection.
- Typical input voltage range: 130 V to 270 V for Single Phase and 280V to 430V for Three Phase
- Stable output voltage: 220/230 V ($\pm 3\%$) for Single Phase and 400 ($\pm 3\%$) for Three Phase
- Output power factor: 0.8
- Power ratings vary by model

This device is ideal for protecting critical equipment such as air conditioners, refrigerators, televisions, and industrial machinery from voltage fluctuations that can cause damage or reduce lifespan.

2. PRODUCT WORKING PRINCIPLE

PVS/PVS III operates via a closed-loop feedback system involving the following components:

- **Voltage Sensing Circuit:** Continuously monitors the output voltage
- **Reference Voltage Source:** Sets the desired output voltage level (e.g., 230V or 400V).
- **Control Circuit:** Compares sensed voltage with the reference and determines the correction needed
- **Servo Motor:** Drives the moving arm of a variable autotransformer (Variac) to adjust the voltage
- **Buck-Boost Transformer:** Connected in series with the main supply, it adds or subtracts voltage to maintain a stable output
- **Limit Switches:** Prevent the servo motor from moving beyond safe mechanical limits

When the output voltage deviates from the preset level, the servo motor rotates the Variac's wiper to increase or decrease the voltage supplied to the buck-boost transformer primary winding. This action compensates for input voltage fluctuations, maintaining the output within $\pm 3\%$ of the set voltage.

The servo motor's precise positioning is controlled by feedback from a potentiometer, ensuring accurate voltage correction. The system's mechanical operation combined with control circuit results in fast, reliable, and low-maintenance voltage stabilization.

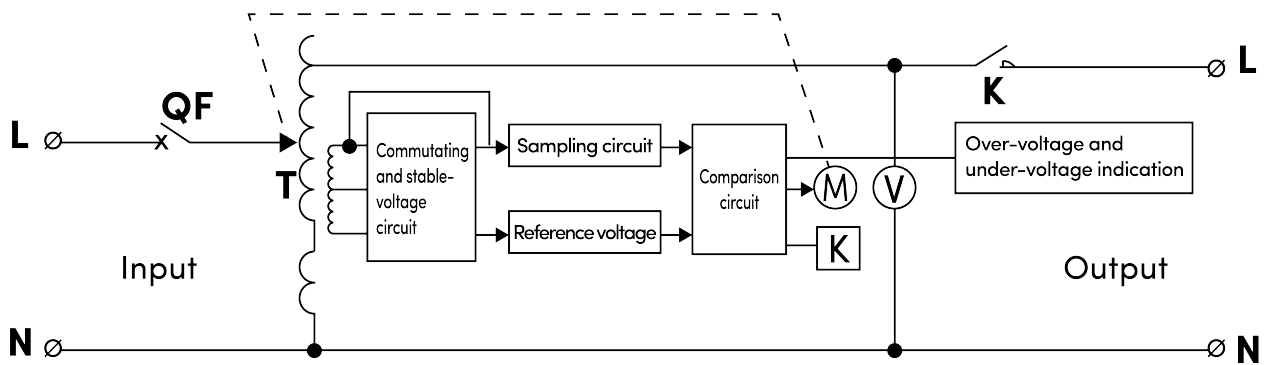


Fig. 1 Typical Block Diagram (Single Phase)

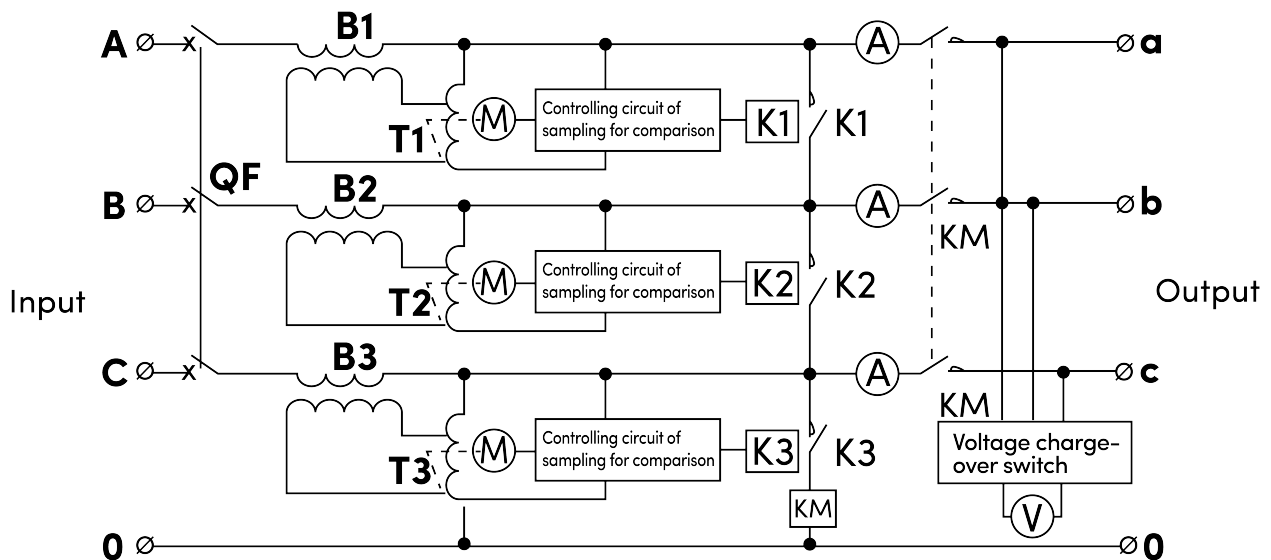


Fig. 2 Typical Block Diagram (Three Phase)

3. PRODUCT OUTLOOK

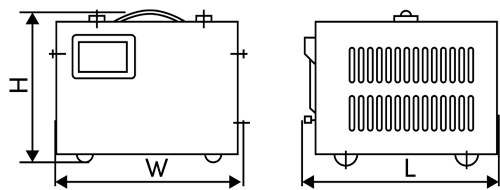


Fig. 3 PVS (1KVA)

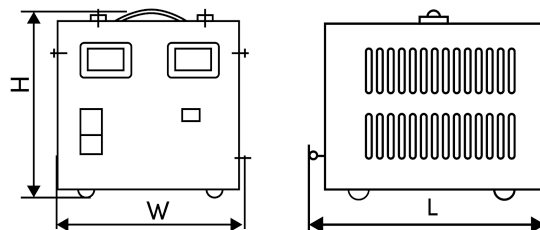


Fig. 4 PVS (2~10KVA)

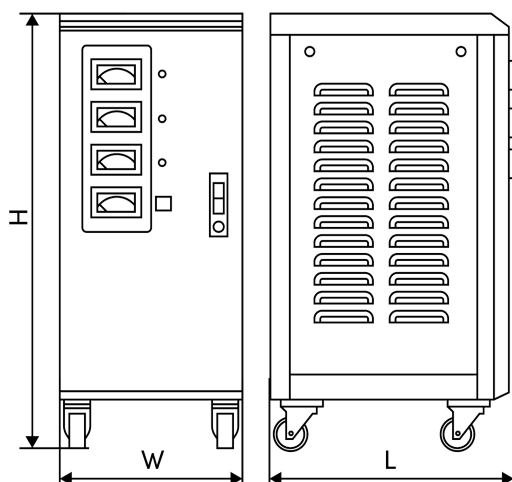


Fig. 5 PVS III (6~100KVA)

Notes: The figures above are for reference only, and there is no further notice for partial change involved in products improvement

4. INSTALLATION GUIDE

Location:

- Install the stabilizer indoors in a clean, dry and ventilated environment
- Avoid locations with excessive dust, moisture or heat sources

Electrical Connections:

- Check the labels of the product to make sure input and output connections are correctly made
- Connect the input connector plug or terminals to the main power supply through an appropriate circuit breaker or fuse
- Connect the output sockets or terminals to the load equipment, ensuring voltage compatibility
- Use cables with sufficient current rating to handle the load without voltage drop or overheating
- Firmly tighten all terminal screws to prevent loose connections

Grounding:

- Connect the stabilizer's grounding terminal to a dedicated earth ground according to local electrical codes
- Never connect the ground wire to water pipes, gas pipes or other public utilities

Power-Up Procedure:

- With no load connected, switch on the stabilizer and measure the output voltage to verify correct operation
- After confirming stable output voltage, connect the load and power on the equipment
- For loads with high starting currents (e.g. compressors), select a stabilizer with at least three times the rated load capacity
- Turn off the stabilizer and load equipment when not in use to prolong service life

5. SAFETY PRECAUTIONS

- Always disconnect the power supply before installation, maintenance or inspection. Wait at least 5 minutes to ensure full discharge
- Confirm correct wiring and grounding before powering the device. Improper grounding can cause electric shock or equipment damage
- Use cables and fuses rated for the stabilizer's maximum current load
- Avoid touching the servo motor or internal components during operation; they may become hot
- Do not overload the stabilizer beyond its rated capacity to prevent overheating and failure
- Install the stabilizer in a dry, well-ventilated area away from direct sunlight, moisture and corrosive gases
- Regularly inspect cables and connections for wear or damage. Replace immediately if faults are detected
- Ensure the carbon brush spring pressure is maintained to avoid sparking inside the stabilizer
- Follow all manufacturer instructions and do not attempt unauthorized repairs

6. OUTPUT POWER DERATING AT DIFFERENT INPUT VOLTAGES

The effective output power capacity of the servo voltage regulator varies with the input voltage level. When the input voltage drops significantly below the nominal range, the stabilizer's ability to maintain full rated output power diminishes.

Typical Derating Guidelines:

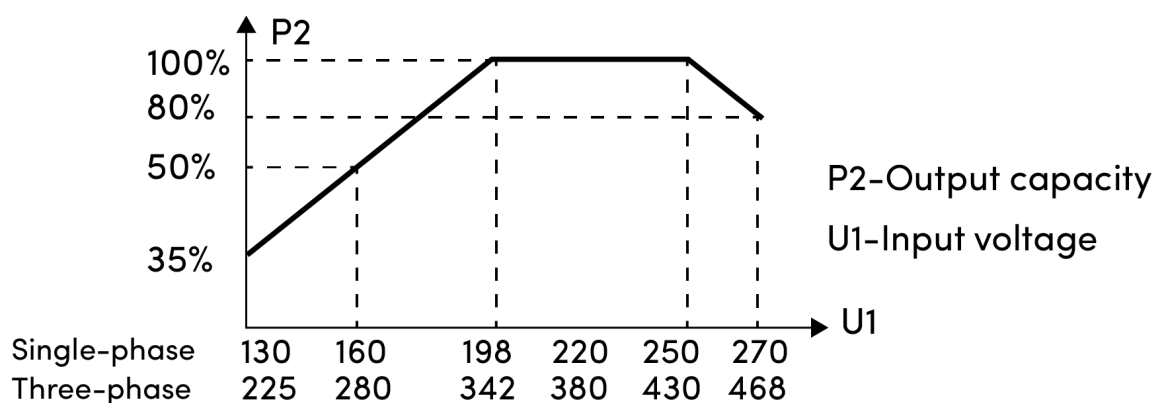


Fig.3 Output Power Derating Curve

This derating occurs because the stabilizer must boost the voltage more at lower input levels, increasing current draw and thermal stress on components. To avoid overloading and ensure reliable operation, select a stabilizer with appropriate capacity margins if input voltage frequently falls below nominal levels.

For example, a 5KVA stabilizer may only deliver around 2.5 to 3.5KVA output power when the input voltage is near 160V. Operating below this range may cause the stabilizer to shut down to protect itself and connected equipment.

7. TROUBLESHOOTING

Symptom	Check List
Under voltage alarm in no load and with load condition	Check whether the input voltage range is according to the product specification or not. Check whether load is increased at the output. If input voltage is within the range and connecting load remains unchanged, contact Prolink support to advise on carbon brush adjustment steps.
Under voltage alarm with load condition	Check input cable size and cable length to ensure no voltage drop.
Poor contact of the carbon brush, and the appearance of arcing and smoke	This could be due to long operation of carbon brush. Contact Prolink support to advise on carbon brush cleaning and adjustment steps.
Unstable output voltage or frequent start and stop issue	Check input voltage range and connected load % to ensure whether they are within acceptable range or not. If there is no abnormalities in input voltage range and load, the issue could be due to faulty servo motor or control PCBA.
How come Ampere Input show 00.0A	It may be your input Ampere is lower than 1A, the Ampere meter range from 1A~60A.
The fuse blew when turning on PVS	Contact Prolink support.
The servo motor arm creates noise when moving	Grating sound of wheel gear movement due to voltage adjustment is normal.
Display meter does not tally with Output voltage	Contact Prolink support.

8. STORAGE AND MAINTENANCE

Storage:

- Store the device in a clean, dry, and dust-free environment
- Avoid exposure to extreme temperatures, humidity, and direct sunlight
- Recommended temperature range for the storage is 25°~40°C
- Keep the stabilizer in its original packaging or a protective enclosure to prevent mechanical damage

Maintenance:

- Periodically clean dust from ventilation openings to prevent overheating
- Inspect wiring, terminals, and cables for wear or corrosion; replace damaged parts immediately
- Check the carbon brush and spring pressure regularly to avoid sparking and ensure smooth servo motor operation
- Verify grounding connections remain secure and corrosion-free
- Avoid disassembling the stabilizer unless performed by qualified personnel
- Store the device disconnected from power when not in use for extended periods to preserve component life

9. PRODUCT SPECIFICATIONS

MODEL	PVS1001AD	PVS2001AD	PVS3001AD	PVS5001AD	PVS7501AD	PVS10001AD
Capacity	1000VA/800W	2000VA/1600W	3000VA/2400W	5000VA/4000W	7500VA/5600W	10000VA/8000W
INPUT						
Nominal Voltage	230VAC single phase					
Voltage Range	130~270VAC					
Frequency	50Hz / 60Hz					
TRANSFORMER						
Transformer Type	Servo Motor Driven Variable Transformer					
Insulation Class	Class B					
Winding Material	100% Aluminium (Option for 100% Copper)					
Transformer Core	High Quality Silicon Steel Sheet					
Moving Arm	High Quality Graphite (Wear Resistant, High Electrical Conductivity, Low Heat Dissipation)					
OUTPUT						
Nominal Voltage	110VAC or 230VAC single phase +/- 1~3%	220VAC or 230VAC single phase +/- 1~3%				
Frequency	50Hz / 60Hz					
EFFICIENCY						
Overall Efficiency	>90%					
INDICATORS						
Digital Meters	Input Current , Output Voltage					
LED	Normal (Green), Under Voltage (Yellow), Over Voltage (Red)					
INPUT PROTECTION						
Delay Time	3s					
Full protection	Over-voltage, Under-voltage, Over-current protection					
OTHERS						
Response Time	< 1 sec (against 10% input voltage variation)					
Insulation Resistance	> 5MΩ					
PHYSICAL						
Dimension (LxWxH) mm	212x190x146	312x238x198	320x233x230	480x242x198	507x277x233	
ENVIRONMENT						
Operating Temperature	-10°~40°C					
Humidity	0~90 % RH (non-condensing)					
Noise Level	<50dB @ 1m				<55dB @ 1m	
COMPLIANCE STANDARD						
Safety	IEC/EN 61558-1, IEC/EN 61558-2					
EMC	IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-6-2, IEC/EN 61000-6-4					

*Efficiency rate will be different based on different models and input voltage range.

Product specifications are subject to change without further notice

D- Digital Display; M- Analog Display

A- Aluminum winding; C- Copper winding

MODEL	PVS III 6001AD	PVS III 9001AD	PVS III 15001AD	PVS III 20001AD	PVS III 30001AD	PVS III 40001AD	PVS III 50001AD	PVS III 60001AD	PVS III 75001AD	PVS III 100001AD
Capacity	6KVA/ 4.8KW	9KVA/ 7.2KW	15KVA/ 12KW	20KVA/ 16KW	30KVA/ 24KW	40KVA/ 32KW	50KVA/ 40KW	60KVA/ 48KW	75KVA/ 60KW	100KVA/ 80KW
INPUT										
Nominal Voltage	400VAC (3Ph+N)									
Voltage Range	280V~430V (195~430V option available)									
Phase	3Ph+N									
Frequency	50Hz/60Hz									
Circuit Breaker	Normal / Bypass (Optional)									
TRANSFORMER										
Transformer Type	Servo Motor Driven Variable Transformer									
Insulation Class	Class B									
Winding Material	100% Aluminum (Option for 100% Copper)									
Transformer Core	High Quality Silicon Steel Sheet									
Moving Arm	High Quality Graphite Contact (Wear Resistant, High Electrical Conductivity, Prevised Voltage Output, Low Heat Dissipation)									
OUTPUT										
Nominal Voltage	400VAC (3Ph+N) ±3%									
Power factor	0.8									
Frequency	50Hz/60Hz									
Overload Capability	up to 100% continuous, up to 150% for 10 sec									
EFFICIENCY										
Overall Efficiency	>90%									
INDICATORS										
Digital Meters	Input Current, Output Voltage									
LED	Normal (Green), Under Voltage (Yellow), Over Voltage (Red)									
PROTECTION										
Delay Time	3s									
Full Protection	Over-voltage, Under-voltage, Over-temp, Over-current protection									
OTHERS										
Response Time	<1sec. (against 10% input voltage deviation)									
Insulation Resistance	>5MΩ									
PHYSICAL										
Dimension (LxWxH)mm	350x275x675	375x315x775	435x360x775	510x395x855	585x465x980	640x520x1085			720x620x1320	
ENVIRONMENT										
Operating Temperature	-10°~40°C									
Humidity	0~90 % RH (non-condensing)									
Noise Level	<60dB @ 1m									
COMPLIANCE STANDARD										
Safety	IEC/EN 61558-1, IEC/EN 61558-2									
EMC	IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-6-2, IEC/EN 61000-6-4									

*Product specifications are subject to change without further notice
 **Efficiency rate will be different based on different models and input voltage range
 A - Aluminum Winding
 C - Copper Winding
 D - Digital Display

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