

AVR3

Three-phase Automatic Voltage Regulator



USER MANUAL

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1. INTRODUCTION

The design of PSS AVR3 series three-phase automatic segregated compensation electron voltage regulator offers an enhanced level of Transient Voltage Surge & Spike Suppression (TVSS) protection. The AVR3 provides effective and reliable protection against voltage fluctuations and line disturbances, delivering an enhanced level of power protection commonly referred to as a 'CLEAN' supply.

2. INSTALLATION

2.1 SAFETY

Under no circumstances should any work be carried out on the AVR3-80, connections or cabling unless the electricity supply is isolated. Only qualified electricians should work on the AVR and its installation.

2.2 INSTALLATION ENVIRONMENT

When select the installation room, please take note of the following:

- I. The place must be dry, clean, and well-ventilated.
- II. Check whether the floor is strong enough to bear the weight of AVR.
- III. Check whether the room is large enough for installation and maintenance.
- IV. When AVR is in operation, check whether the
- V. ambient temperature is between 0°C ~ 40°C.
- VI. Relative humidity: 0% ~ 90% with no condensation
- VII. Altitude: <1000 meter
- VIII. Don't place the machine directly in sunlight or near the heat source.

2.3 POSITIONING

It is important to carefully consider the place chosen to site the AVR. A position allowing access on all four sides to permit preventative maintenance would be advantageous.

As there are cooling fans mounted in the cabinets it is important that there should be adequate space around the unit. The unit should be positioned such that a free flow of air is available. It is especially important to ensure that cooling fan inlets and outlets are free from obstruction.

2.4 CABLES AND TERMINATIONS

The following cable sizes are for your reference, based on 10m of copper thermoplastic 75°C.

Select the correct cable and protection, considering factors such as current rating, voltage drop, loop impedance, installation derating and short circuit.

Cable Guide		AVR3-50	AVR3-80	AVR3-100	AVR3-120	AVR3-150	AVR3-200	AVR3-250	AVR3-300	AVR3-400	AVR3-500	AVR3-600
Conductor Size	mm ²	16	25	50	70	95	120	185	240	400	2x300	2x400
Earth Size	mm ²	6	6	16	25	25	35	70	95	120	2x120	2x120
Max Current	A	73	94	136	170	208	237	304	359	468	646	748
Volt Drop @ 10m	%	0.40%	0.40%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.10%	0.10%
Earth Loop	m	202	224	553	849	915	1229	2166	2819	3482	6727	6965

Table 1- Cable Guide

NOTE: Installation to be conducted in accordance with AS/NZS 3008 and all applicable local &/ site-specific electrical standards. Installation to be conducted by a suitably registered and trained Electrician.



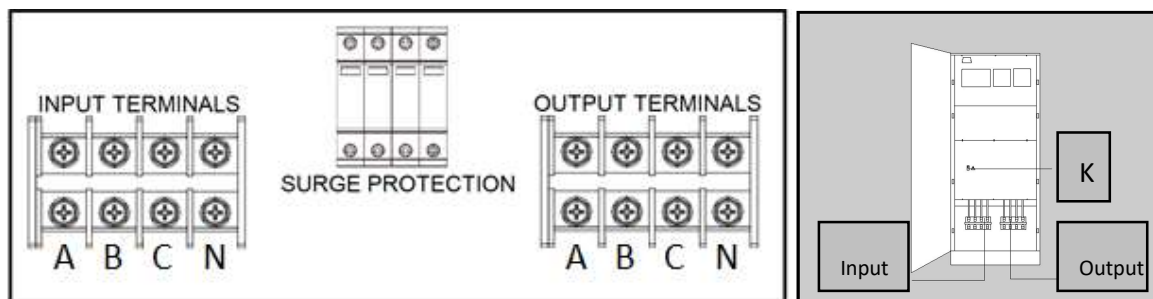


Figure 1- Terminal connection accessible rear of AVR

3. SPECIFICATIONS

Model		AVR3-50	AVR3-80	AVR3-100	AVR3-120	AVR3-150	AVR3-200	AVR3-250	AVR3-300	AVR3-400	AVR3-500	AVR3-600
Power	0.8 lag	50kVA	80kVA	100kVA	120kVA	150kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA
	Unity	40kW	64kW	80kW	96kW	120kW	160kW	200kW	240kW	320kW	400kW	480kW
Output Current per phase @ 230Vph-N	0.8 lag	72A	116A	145A	174A	217A	290A	362A	435A	580A	725A	870A
	Unity	58A	93A	116A	139A	174A	232A	290A	348A	464A	580A	696A
Input Voltage		400V±20%										
Output Voltage		400V±2%										
Phase		3 Phase N + E										
Frequency		50Hz										
Response Time		<1 second										
Accuracy		2%										
Efficiency		>98%										
Power Factor		0.8										
Protection		Over Voltage, Under Voltage, Phase Failure, Over Load, Over Current, Short Circuit, Manual Bypass										
Overload		150% - 10 seconds, 120 % - 60 minutes										
Waveform Distortion		No additional waveform distortion										
Insulation Level		Level H, 180°C										
Ambient Temperature		0°C~45°C										
Relative Humidity		0~90% (Non-condensing)										
Cooling Method		Forced ventilation (Fan)										
Dimensions	mm	660*850*1100				660*950*1240			1100*800*1930		1100*800*2200	
Net Weight	Kg	360	400	430	450	500	590	670	880	940	1480	1670

Table 2 - Specifications

4. WORKING PRINCIPLE

The AVR is composed of a voltage regulator circuit, a control circuitry and a servo motor. The control continually samples the input voltages, output voltage and changes in the load.

The control reacts to any changes by automatically adjusting the individual servo motors to maintain a constant output voltage.

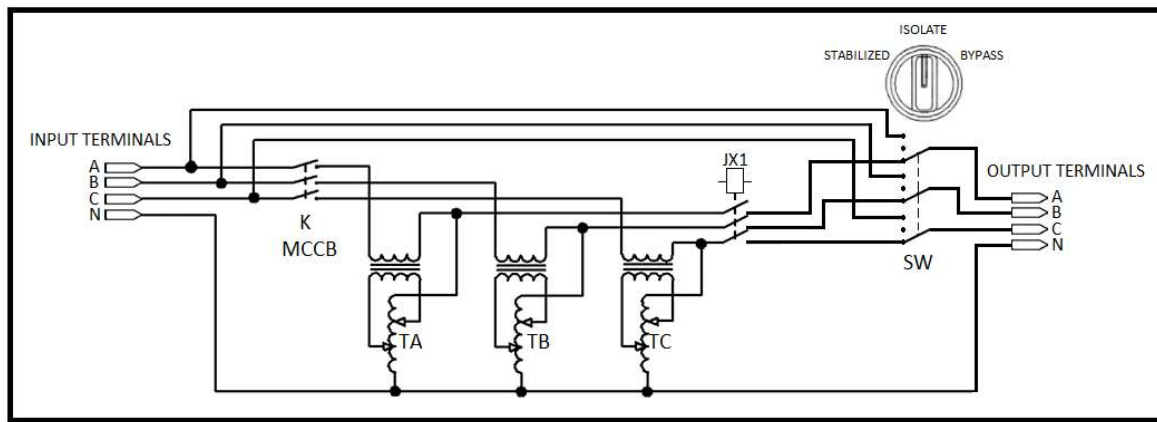


Figure 2 - AVR3

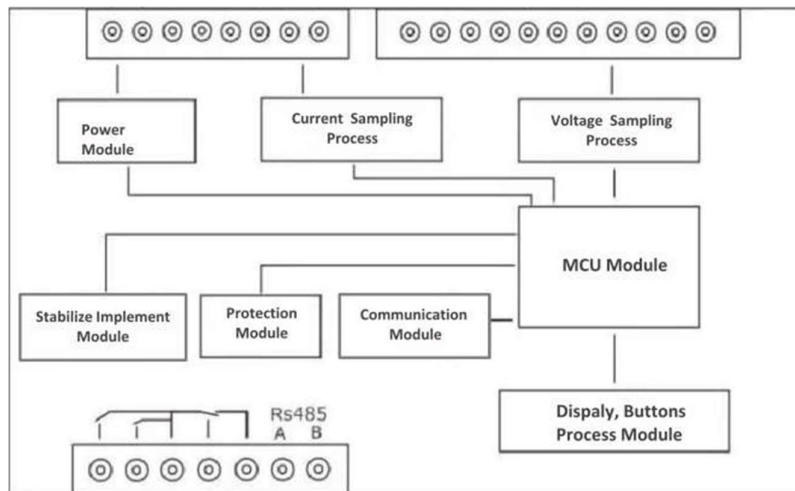


Figure 3 - AVR3 Control

5. OPERATION

5.1 START-UP

- I. Ensure the input is energized.
- II. Switch the selector switch to the 1 – “Stabilized Output” position.
- III. NOTE: The selector switches from Stabilized Output (1) / Isolate (2) / Bypass (3)
 - a. Position 1 – The load is supplied by the AVR.
 - b. Position 2 – The load is de-energized and isolated.
 - c. Position 3 – The load is supplied by unprotected power.
- IV. Switch ON the AVR – Switch K
- V. The rear door must be securely closed and locked to ensure unqualified persons do not have access to potentially lethal voltages.

5.2 ISOLATING

- I. Switch the selector switch to the 2 – “Isolate” position.
- II. Switch OFF the AVR – Switch K
- III. Ensure the rear door is securely closed and locked.

5.3 BYPASS

- I. Switch the selector switch to the 3 – “Bypass” position.
- II. Ensure the rear door is securely closed and locked.

5.4 CONTROL / LCD DISPLAY

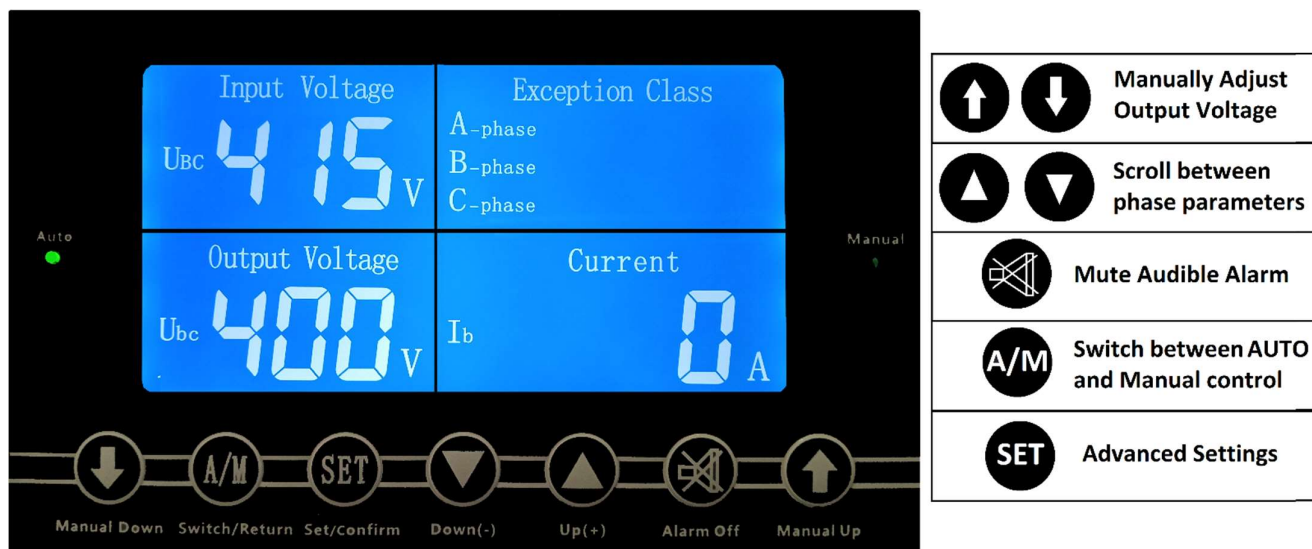


Figure 4 - AVR Display

6. MAINTENANCE

It is recommended that the AVR is maintained at least every 12 months. The duration between maintenance is depended on the operating environment.

- I. During maintenance, it the AVR's input power must be disconnected.
- II. Verify that the internal fans are operating.
- III. Check the tightness of the servo chain.
- IV. Lubricate all mechanical transmission components.
- V. Remove any contaminants.
- VI. Check that all internal components are tight.
- VII. Check the condition of the carbon brushes and replace if required.