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Power Solutions

# PCU-SVR


Power Conditioning Unit (PCU) / Static Voltage Regulator (SVR) is a Microprocessor based IGBT electronic device with PWM technology, having an RFI / EMI filters. It regulates fluctuating voltage in a precise manner & constitutes a high-level spike suppression system which protects the equipment by virtually eliminating any transients, surges and EMI/RFI noises in the distribution network. Power Conditioning Unit / Static Voltage Regulator is most suitable for 24-hour continuous process operations where break downs due to fluctuations results in heavy financial loses and damage of expensive equipments.

## APPLICATIONS

- Refineries & their distribution outlets
- Petrol/Diesel Retail Outlets
- Hospitals, Diagnostic labs & imaging equipments
- General laboratory equipments
- Broadcast communications & Telecommunication equipment
- Machine tools / CNC equipments & Industrial Automation applications
- Building / Shopping mall automation
- Data Centers / Call Centers
- Process industries &Chemical plants
- UPS bypass & Power distribution

## TECHNOLOGY

PCU/SVR regulates the voltage by IGBT driven PWM Inverter at 20 KHz switching frequency with voltage correction rate of 5000V/Sec., so that the output voltage complies with the requirements of ITIC Curve for regulated minimum voltage supply to electronic devices, machinery and IT equipments. Voltage regulation achieved by superimposition of PWM wave on incoming wave, without any brake in the power path. The micro processor-based control circuitry along with IGBT results in high correction speed and higher efficiency. There is no moving part inside PCU/SVR and it is a fully electronic & automatic unit.

## COMPARISON BETWEEN POWER CONDITIONING UNIT (PCU)/STATIC VOLTAGE REGULATOR (SVR) & SERVO VOLTAGE STABILIZER

| **Power Conditioning Unit /Static Voltage Regulator** | **Servo Voltage Stabilizer** |
|---|---|
| Output voltage is regulated by using Buck Boost transformer | Output voltage is regulated by using double wound dimmer |
| Switching devices are IGBT which improves the reliability of the system. | Switching devices are Relay which is a Electro-mechanical device & is less reliable. |
| No moving part inside and is a fully electronic unit | Carbon brushes generate sparks and Gear assembly makes noises. It is prone to frequent wear and tear that requires regular maintenance. |
| Correction speed is very fast, almost 5000V/Sec. (Min.) | Rate of correction is slow, almost 30V/Sec. |
| Response time is higher | Poor Response time |
| Over Shoot and Under Shoot exists for less duration | Over Shoot and Under Shoot exists for long duration |
| No cooling oil required | Oil cooling is messy & is required to be changed periodically |

## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| GENERAL | Voltage regulation shall be performed by IGBT driven PWM inverter operating at around 20 KHz switching frequency with typical voltage correction time of 20 ms (one AC cycle for 50Hz Supply), so that the output voltage complies with the requirements of ITIC curve for regulated voltage supply to electronic machinery.<br>Voltage regulation shall be achieved by superimposition of PWM wave on incoming wave, without any brake in the power path.<br>Power Conditioning Unit (PCU) / Static Voltage regulator (SVR) shall use only static parts for real-time voltage correction. It shall not use any such moving part like relay or brush, which limits the rate of voltage regulation.<br>There shall be no switching in the power path, current interruption, transitions or step changes during voltage regulation.<br>The output voltage shall be duly free of harmful surges, spikes and EMI/ RFI noises. |
| Type | Single / Three phase, Unbalanced load |
| Rating | KVA-100KVA |
| Frequency | 47 - 63 Hz |
| Full Regulation Range | Input Voltage Range: 160 - 280 V AC (P-N), 275 - 480VAC(P-P)<br>Output Voltage: 230 V ± 1 % - P-N (Adjustable)<br>400 V ± 1%- P-P (Adjustable) |
| Relaxed Regulation Range | Input Voltage Range: 140 - 300 V AC (P-N), 240 - 520VAC(P-P)<br>Output Voltage Functional Range: of 200 - 250V P-N |
| Duty cycle | Continuous |

| | |
|---|---|
| Waveform distortion | NIL |
| Speed of correction | 5000 V/sec, the said voltage regulator shall sense as well as correct any voltage Sag / Surge / Fluctuation in 20 ms, i.e. 1 waveform |
| Response time | 10 mS |
| Overload capacity | 125% for 60 mins. |
| Efficiency | > 96% in worst conditions i.e. at 100% and lowest voltage. |
| Cooling | Naturally Air cooled / Forced Air Cooled |
| Protections | MCB / MCCB at Input for overload & short circuit protection.<br>Contractor at output for auto-resumption of supply in event of<br>High Voltage / Low voltage / Single Phase prevention.<br>Input Low Voltage cutoff: - 140 V<br>Input High voltage cutoff: - 300 V |
| Automatic Bypass for surge load | |
| Manual Bypass Switch to bypass the full equipment | |
| Heavy-duty, three-stage AC input surge protection circuits shall be of class 2, consisting of inductor, capacitor and MOV (Metal Oxide Varistor). All 3 phases shall be protected by separate surge protectors. Noise filters shall be provided on input as well as output to protect against high frequency EMI / RFI noises. MOVs shall be provided between Phase to Neutral and also between Neutral to Ground.<br>Additional, type 2 surge protection device shall be provided with provision of shunt trip in event of failure of surge device. Also, provision for by passing the surge protection device for running the outlet when SPD is not in service. | |
| Indications /Annunciation | LED display is provided for each phase showing input voltage, output voltage, load & fault condition due to over voltage,<br>under voltage, over load, short circuit, excess temperature with counter. |
| Environmental Protection | IP 20 |
| Class of insulation | Class H |
| Cabinet shall be heavy duty PVC / PU wheel mounted with at least 2 lockable wheels & Internal parts shall be readily accessible and replaceable (by opening the cabinet cover). | |
| Buck Boost Transformer used shall be designed at 1.2 Tesla Flux density maximum, +/- 2%. | |
| Control Card used shall have 100% RoHS components plus shall be conformal coated | |
| Surge Card used shall have Fire Retardant Capacitors | |
| Equipment shall have service life of at least 10 years | |
| Remote monitoring through RS-485 interface to observe parameter of PCU/SVR RS-485 to VSB convertor (optional) | |

*In the Interest of continuous product improvement, all specifications are subject to change without notice.

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