

BENEFITS

- Instantaneous Correction and outstanding voltage regulation makes this an ideal choice for all types of computerized, numerical data controlled machines.
- Compatible with all loads, including regenerative loads, as it does not switch any components in the power path.
- Energy efficient replacement for energy guzzling CVT.
- Highly cost effective solution when compared to on line UPS, when battery power back-up is not mandatory.
- It's ultra-low impedance assures stability even with the most demanding loads.
- The automatic bypass assures that the connected equipment will not shut down, and keep getting raw power corrected for surges, spikes & electrical noise, even if VRp fails.
- Inbuilt protections for abnormalities such as high-low voltage, single phasing, neutral break.
- Aesthetic design, compact size, low weight and quiet operation.

STRONG PARENTAGE. BEST SOLUTIONS.

- TSi Elecpower is the Indian manufacturing JV for legendary TSi products sold in the entire Asian & African continents.
- TSi Elecpower is licensed by TSi Power Corporation U.S.A.
- It has access to TSi's latest solid-state power conditioning technologies backed by strong R&D.
- Its promoters have long experience in power quality issues of not only developed countries with stable power, but also developing countries with poor power infrastructure.
- All TSi products feature high reliability, simplicity and aesthetics for best consumer experience.



ENHANCED PERFORMANCE OF CNC MACHINES THROUGH NEXT-GEN LINE CONDITIONING TECHNOLOGY

TSi RANGE OF VRp FOR ELECTRONICS AND CNC MACHINERY APPLICATIONS

TSi Elecpower offers a full range of VRp-Precision PWM Line Conditioners featuring solid state voltage regulation technology, with tightly controlled output power quality.

Our line conditioners are for applications where stable power is mandatory for electronically operated, microprocessor controlled CNC machinery, automation, robotics, testing, measurement & process control systems in industries as diverse as:

- Automobiles & Auto Ancillary Industry
- Textile Machines & Power Looms
- Plastic Moulding Industry
- Packaging & Printing
- Engineering Industry
- Pharma & Medical
- Process Industry
- Metals Industry

These are compact, light-weight, tightly regulating line conditioners that respond instantly with a wide input voltage range but without switching the active power path. With inbuilt excellent surge voltage protection and electrical noise control circuits, using only passive components, our VRp series is your ideal accessory for power conditioning, to ensure trouble-free operation of Computerized Numerically Controlled (CNC) machines even with a poor quality of mains AC supply.



COMPARISON

FEATURES	Servo Voltage Stabilizer	Ferro Resonant CVT	On line UPS	AVR with SCR based Tap Changer	VRp - Solid State PWM Voltage Regulator
Stepless Voltage Correction	Yes	Yes	Yes	No	Yes
Instant, Real-time, Precision Voltage Correction	Poor	Depends on Load & Line	Yes	No	Yes
Brown-outs Elimination	No	Yes	Yes	No	Yes
Surge & Spike Suppression	No	Excellent	Yes	No	Yes
Load Regulation	Excellent	Very Poor	Good	Good	Excellent
Ability to handle regenerative loading	Becomes Unsteady	Poor, can't handle	Can't handle	Satisfactory	Excellent, stays undisturbed
Power Back-up	No	No	Yes	No	No
Load Compatibility	Good	Poor	Poor	Poor, under inductive loads	Excellent
Overload Capacity	Yes	Poor	To a limited extent	Yes	Yes
Static Design / No Moving Parts	No	Yes	Yes	Yes	Yes
Reliability against Breakdowns	Maintenance Prone	Excellent	Excellent	Poor under inductive loads	Excellent
Servicing/Installation	Support Needed	Simple	Simple, but batteries need regular maintenance	Simple	Simple (Plug and Play)
Built Auto Fast Bypass System	No	N/A	Yes	No	Yes
Energy Saving	Yes	No, energy guzzler	No, due to poor efficiency of double conversion	Limited Saving	Yes
Voltage overshoot during Mains Cycle	Yes	Can be very high	Never	Yes	Never
Soft Switch-on	No	No	Yes	No	Yes
Cost of ownership	High, due to maintenance, failures & technology limitations	High, due to poor efficiency	Extremely high, only justified in case back up power is mandatory	High, esp due to frequent failures under inductive loads	Extremely cost effective

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FEATURE	SINGLE PHASE MODELS			THREE PHASE MODELS				
	± 13% full regulation	± 20% full regulation	± 26% full regulation	± 13% full regulation	± 20% full regulation	± 26% full regulation		
ELECTRICAL	Capacity in kVA (watts)	2 KVA to 13 KVA	1 KVA to 15 KVA	3 KVA to 10 KVA	6 KVA to 130 KVA	3 KVA to 100 KVA	6 KVA to 75 KVA	
	Regulator Engine	High frequency 20 KHz IGBT driven voltage regulation convertor						
INPUT	*Nominal Voltage	240 VAC (Single Phase)	230 VAC (Single Phase)	230 VAC (Single Phase)	415 VAC (3-Phase)	400 VAC (3-Phase)	400 VAC (3-Phase)	
	Normal Operating Voltage (typical output regulation within +/-1% of nominal)	207-271 Volts AC	184-276 Volts AC	170-290 Volts AC	360-470 Volts AC	320-480 Volts AC	295-505 Volts AC	
	Relaxed operating voltage within max rated input current capacity & within output Hi-Lo cutoff range of 200-250V P-N)	173-283 Volts AC	160-300 Volts AC	148-315 Volts AC	300-490 Volts AC	277-520 Volts AC	256-545 Volts AC	
	Nominal Frequency	47-63 Hz						
	Input Circuit Breaker Rating	MCB of suitable rating			3 phase ganged MCB up to 63 Amp & MCCB for 80 Amp & above			
	AC Connection	Terminal Block (L1 in, neutral and ground wires) provided			Terminal block (L1 in , L2in, L3in, neutral and ground wires) provided			
OUTPUT	*Nominal Voltage	240 VAC (Single Phase)	230 VAC (Single Phase)		415 Volts AC (3-phase)	400 Volts AC (3-phase)		
	Typical power efficiency with 20-100% load conditions & worst incoming voltage	Over 97%	Over 96%	Over 95%	Over 97%	Over 96%	Over 95%	
	Voltage regulation (typical, excluding meter error)	±1%						
	System status indicator	Green LED (ON) indicates Normal (regulating mode) operation						
	AC Connection	Terminal block (L1 op, neutral and ground wires)			Terminal block (L1 op, L2op, L3op, neutral and ground wires)			
PHYSICAL	Dimensions (in mm)		240Wx165Hx365D (upto 1KVA)		320Wx660Hx500D (upto 15 KVA)	320Wx660Hx500D (upto 9 KVA)	320Wx660Hx500D (upto 6 KVA)	
			240Wx165Hx415D (upto 8KVA)	240Wx165Hx415D (upto 5KVA)	240Wx165Hx415D (upto 3KVA)	610Wx570Hx610D (upto 40 KVA)	610Wx570Hx610D (upto 30 KVA)	610Wx570Hx610D (upto 25 KVA)
			400Wx280Hx540D (upto 12.5 KVA)	400Wx280Hx540D (upto 10 KVA)	400Wx280Hx540D (upto 10 KVA)	660Wx570Hx660D (upto 75 KVA)	660Wx570Hx660D (upto 45 KVA)	660Wx570Hx660D (upto 32 KVA)
	Weight (approx.)	10 kgs for smallest capacity to 56 kgs for largest capacity			60 kgs for smallest capacity to 300 kgs for largest capacity			
	Display & Annunciation	LED display & Annunciation for Regulation mode, Bypass mode & Fault conditions			Digital output voltage display with selector switch. LED display & Annunciation for Regulation mode, Bypass mode & Fault conditions			
	Mounting	Pad Mounted			Pad Mounted for smallest cabinet size, wheel mounted for larger sizes			
PROTECTIVE FEATURES	Standards & Safety	Designed to meet UL 60950-1 standards. Protection class IP 20						
	OV/UV cut off with SPP & NBP	Automatic trip in event of High/Low voltage with automatic reset			Automatic trip in event of High/Low/Missing voltage with manual reset			
	Overload & Short Circuit Protection	Through suitably rated input circuit breaker						
	Soft Switch-On Feature	Ensure that output voltage is never higher than input voltage upon switch-on, before it commences full stabilization.						
	Automatic Bypass	Automatic bypass will be activated when there is a fault condition						
	Surge Test Conditions	Per Class 2 Surge (combination wave)						
	Surge let-through Voltages	1.2 X 50µs, 6kV, 8 X 20 µs, 3 kA waveform. L-N < 300V						
ENVIRONMENTAL	Ambient Temperature	0° to + 45° Celsius (32° to +113° Fahrenheit), 10 to 90% RH non-condensing						
	Cabinet Cooling Method	Natural Cooled			Fan Cooled			

NOTES

Nominal output voltage can be factory preset at any value between 215 to 240V P-N. Regulation range will accordingly shift.

All models of VRp's are optionally available with additional 400 Volts to 200 Volts step down transformers.

TSi Range of VRp

TSi range of VRp Precision PWM Line Conditioners allows trouble-free operation of electronic equipment over a wide mains voltage fluctuation & poor incoming quality of power found in many developing countries. Thanks to the continuous Pulse Width Modulation (PWM) switching of a buck-boost transformer, there is no switching of taps or a break in the power path. This enables any nature of load to be handled, including regenerative load.

The high frequency insulated gate bipolar transistor (IGBT) driven converter takes the incoming AC power, measures against the nominal voltage and adds or subtracts voltage, 20,000 times per second, to achieve precisely regulated 230 V ac output. This assures precise regulation, wave after wave, irrespective of fluctuations on incoming supply side.

