www.tsipower.in

TAKE CHARGE OF YOUR POWER

TSi Power

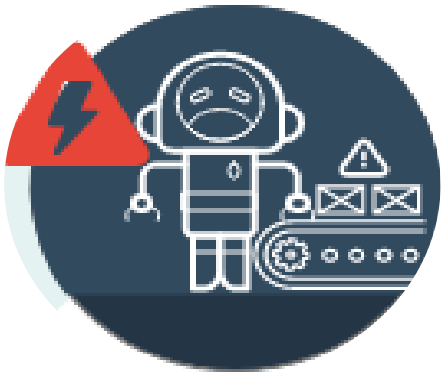
“Modern Machines need Modern Power Conditioning Technologies”

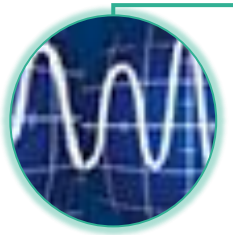
Power Conditioning Technologies must keep pace with modern manufacturing technologies.

TSi Power (P) Ltd., Vadodara, India is a JV with TSi Power Corporation, USA, which provides unique state-of-the-art solutions to enable you to take charge of your power quality issues and to ensure that your modern machines run flawless @ peak productivity.

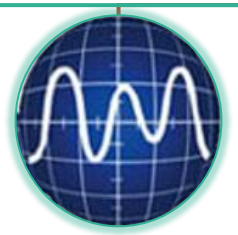
TSi Power Conditioning Solutions could be your best investment to boost machine performance and productivity?

Common Power Quality Problems That Damage Your Machinery

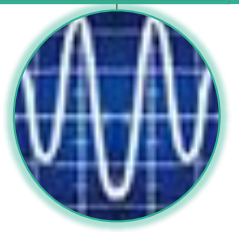




Time-Of-The-Day Voltage Variations



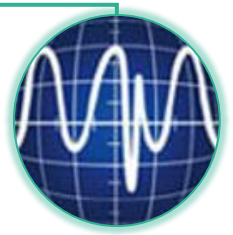
Voltage Sag or brown-out



Voltage Swell

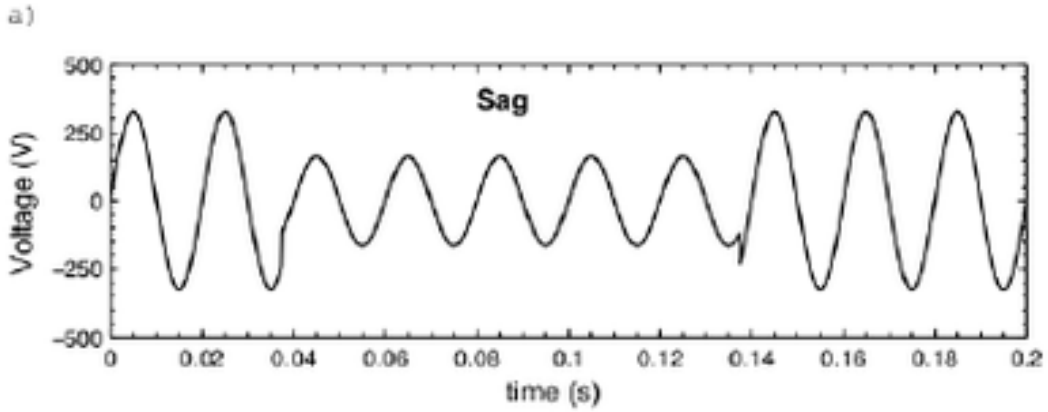
Voltage Spike

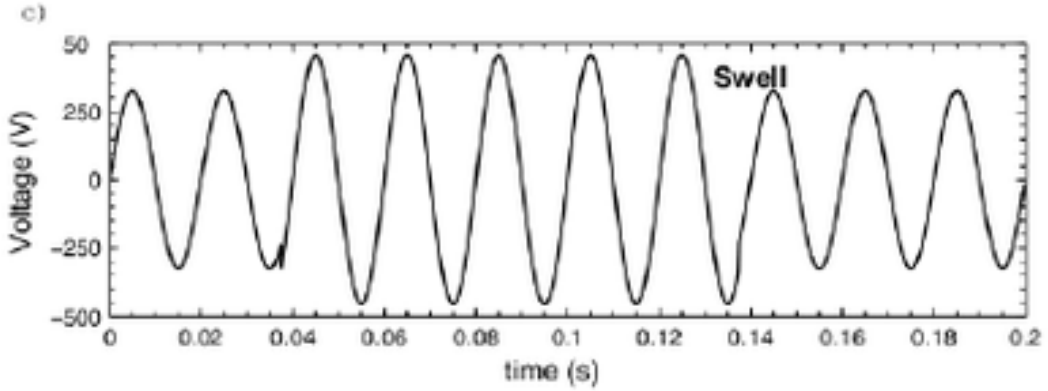
Line Noise

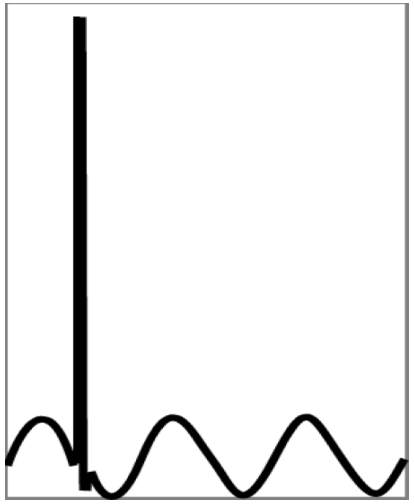


Transients

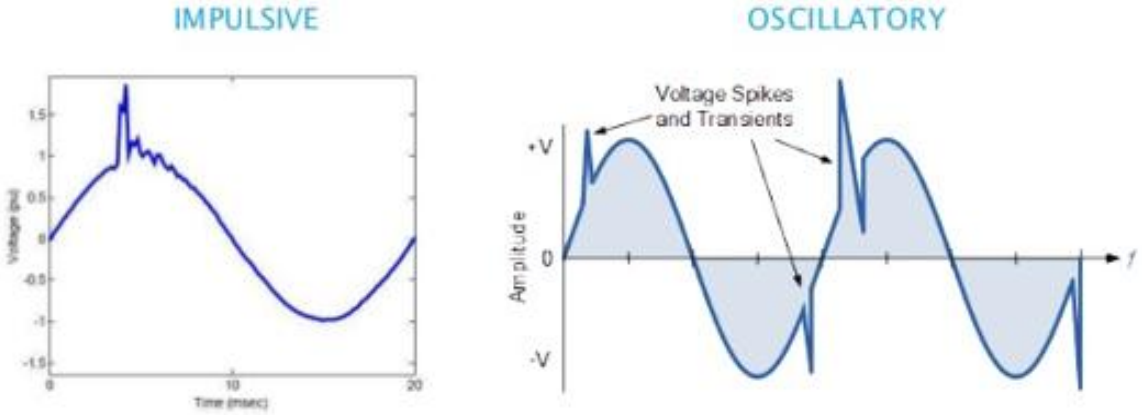
Sag, Swell, Spike & Transients





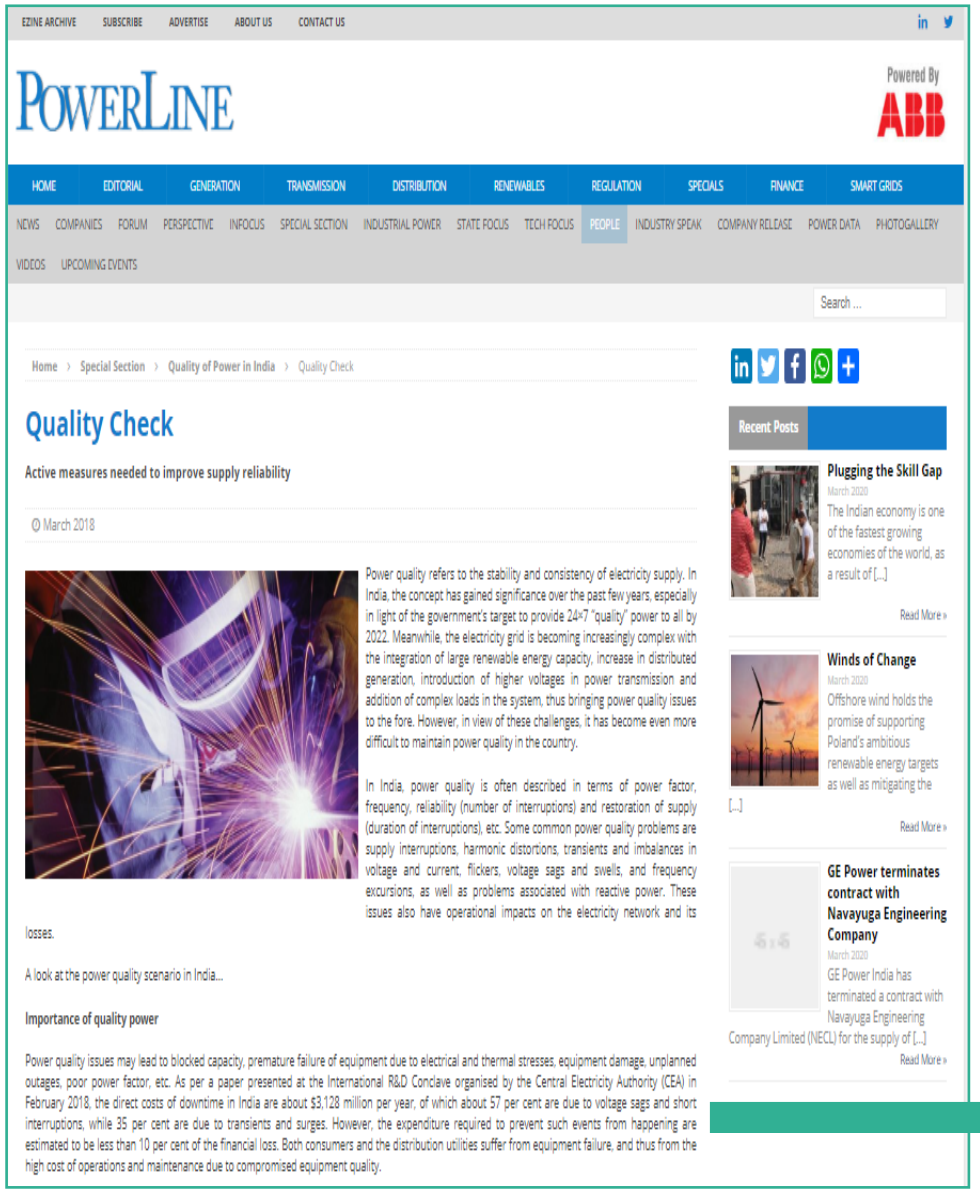


Spike



Transients

Power Conditioning Technologies Have Not Kept Pace With Power Quality Issues



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Home › Special Section › Quality of Power in India › Quality Check

Quality Check

Active measures needed to improve supply reliability

March 2018

Power quality refers to the stability and consistency of electricity supply. In India, the concept has gained significance over the past few years, especially in light of the government's target to provide 24×7 "quality" power to all by 2022. Meanwhile, the electricity grid is becoming increasingly complex with the integration of large renewable energy capacity, increase in distributed generation, introduction of higher voltages in power transmission and addition of complex loads in the system, thus bringing power quality issues to the fore. However, in view of these challenges, it has become even more difficult to maintain power quality in the country.

In India, power quality is often described in terms of power factor, frequency, reliability (number of interruptions) and restoration of supply (duration of interruptions), etc. Some common power quality problems are supply interruptions, harmonic distortions, transients and imbalances in voltage and current, flickers, voltage sags and swells, and frequency excursions, as well as problems associated with reactive power. These issues also have operational impacts on the electricity network and its losses.

A look at the power quality scenario in India...

Importance of quality power

Power quality issues may lead to blocked capacity, premature failure of equipment due to electrical and thermal stresses, equipment damage, unplanned outages, poor power factor, etc. As per a paper presented at the International R&D Conclave organised by the Central Electricity Authority (CEA) in February 2018, the direct costs of downtime in India are about $3,128 million per year, of which about 57 per cent are due to voltage sags and short interruptions, while 35 per cent are due to transients and surges. However, the expenditure required to prevent such events from happening are estimated to be less than 10 per cent of the financial loss. Both consumers and the distribution utilities suffer from equipment failure, and thus from the high cost of operations and maintenance due to compromised equipment quality.

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- *You may be surprised to know that **92% of the power quality problems remain unsolved** by conventional methods of power conditioning.*
- *Power Conditioning Technologies have not kept* pace with modern manufacturing Technologies.
- *This is the single most important reason for loss of productivity in modern electronic machines.*

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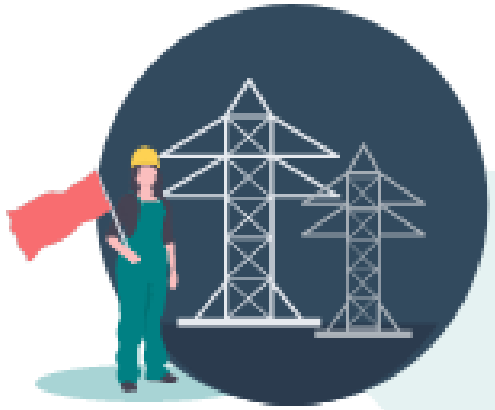
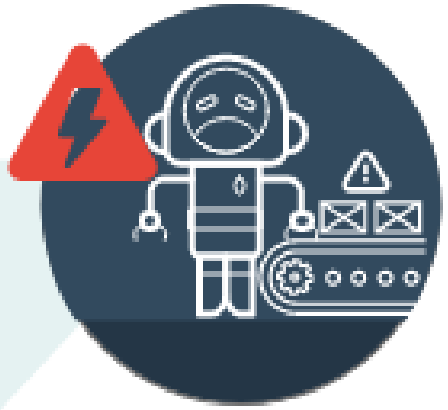
Next Gen Electronic Machinery Can Not Tolerate Bad Power Quality



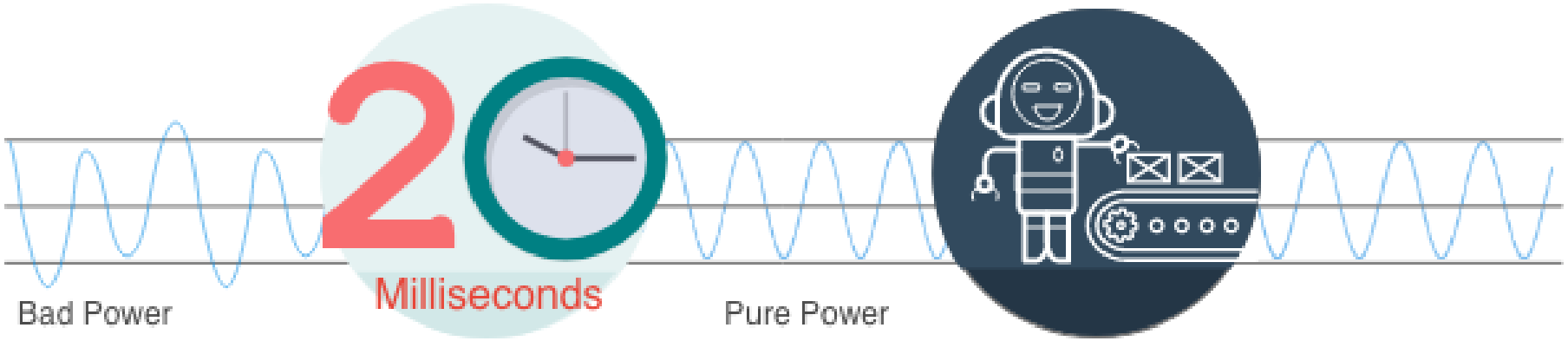
Leads to



Bad power quality
causing
voltage disturbances like
sags, swells, spikes,
transients and HF noises.

Shutdown and damages
sensitive electronic
production machines,
data corruption, tool breakages,
loss of profits.

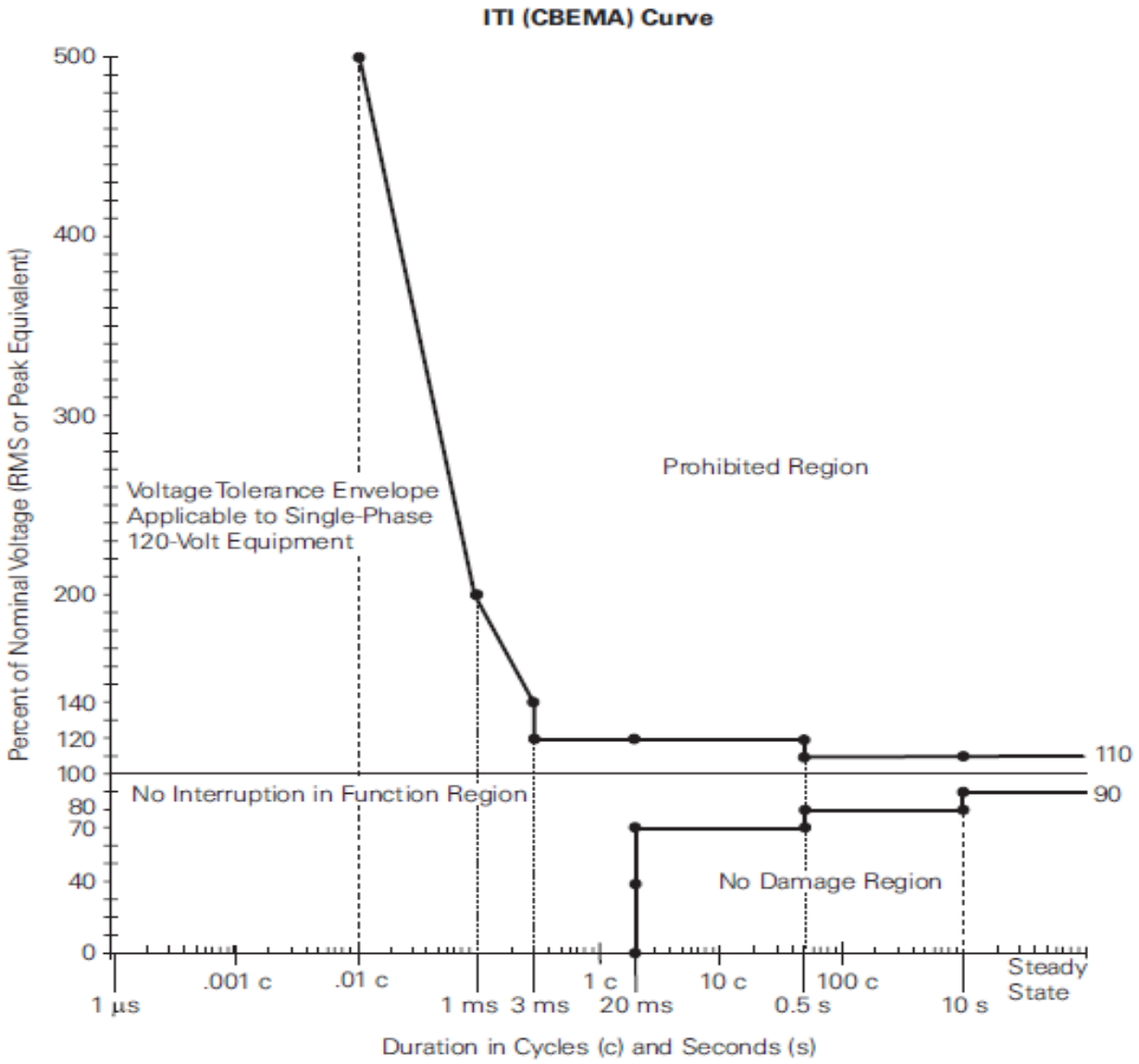
TSi’s Secret For Powering Modern Electronic Machines



Time slot available to correct all voltage disturbances and convert bad power into precision power, conforming to ITIC Curve for Electronics.

PWM Static Voltage Regulation technology corrects all Disrupted Voltages & Bad Quality Power and supplies ‘Pure Power’ leading to no downtime in the production line.

Why 20 Milliseconds?

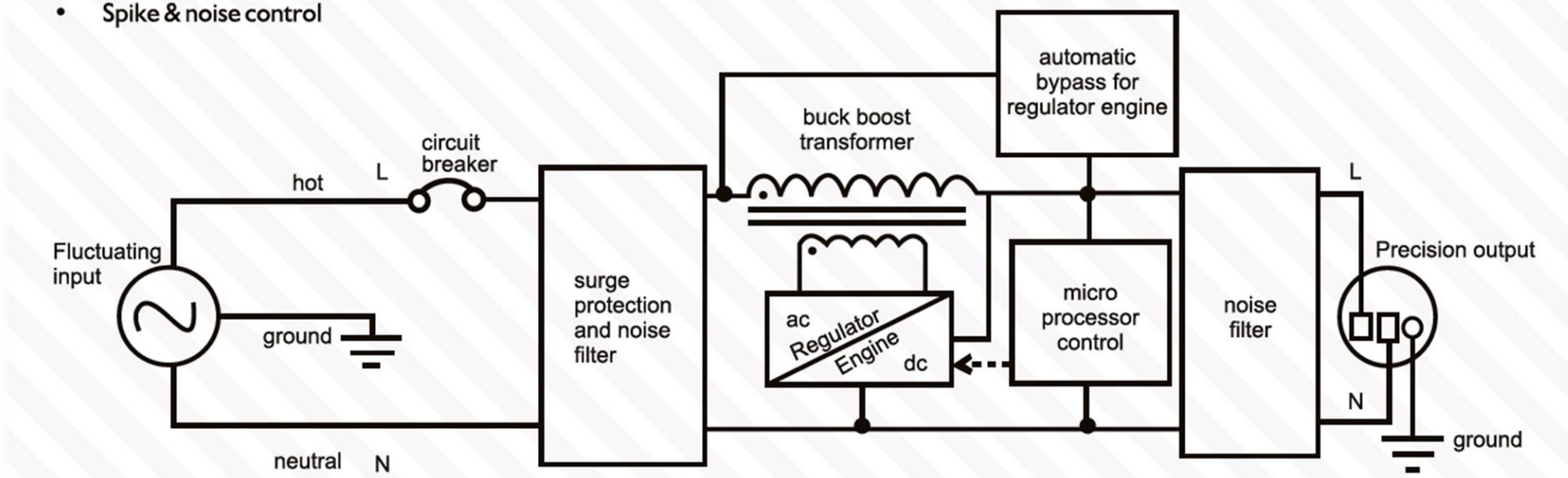


Because Modern Machines Demand Precision Voltage Supply as per ITI Curve

TSi- Static Power Conditioning Technology Architecture

It is a revolutionary technology that provides:

- Optimum voltage compensation
- Sag control
- Swell control
- Spike & noise control



Correcting power disturbances within 1 waveform has now been made possible with Static Power Conditioning Technology developed after extensive field trials and experience gained by us in developing countries over last decade.

Demo Set-up

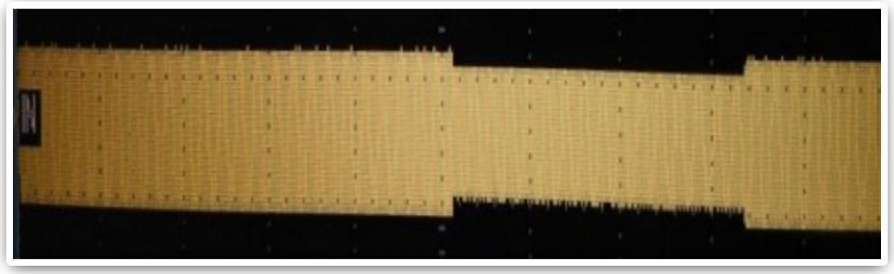
- *This demo Set-up demonstrates **how TSi-VRP reacts to a Sag/Swell v/s how Servo Voltage Stabilizer reacts to a Sag/Swell***

- *Dimmerstat giving input to a Sag/Swell Generator*

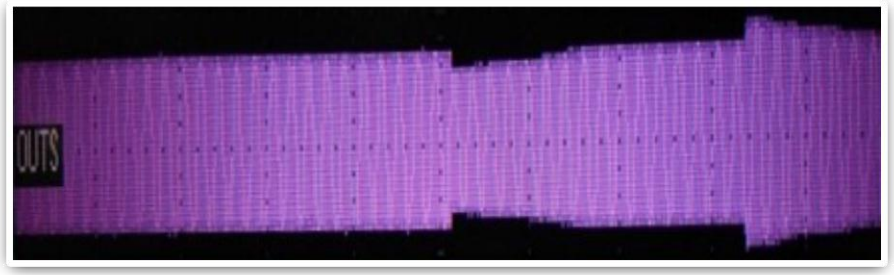
- *Sag/Swell Generator output is going to Servo as well as TSi-VRP. Sag/Swell Generator output is measured by Oscilloscope*

- *TSi-VRP as well Servo output is measured by Oscilloscope*

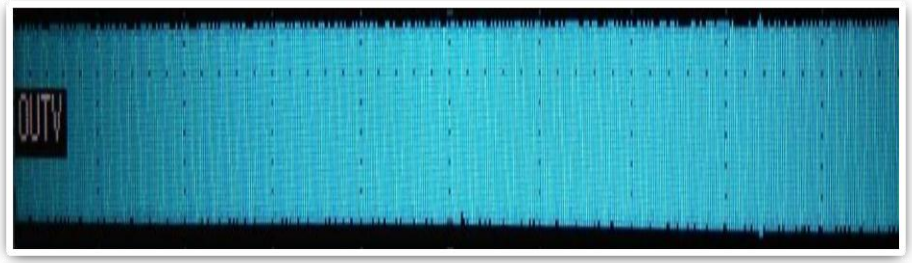
Waveforms Of Output Of Servo Stabilizer v/s TSi-VRP During Sag Event



Input Sag



Output of Servo Stabilizer during and after Sag



Output of TSi-VRP during and after Sag

A video showing the same is available for watching on to this link: **Technology Demonstration of TSi Power-India's Static Power Conditioner**

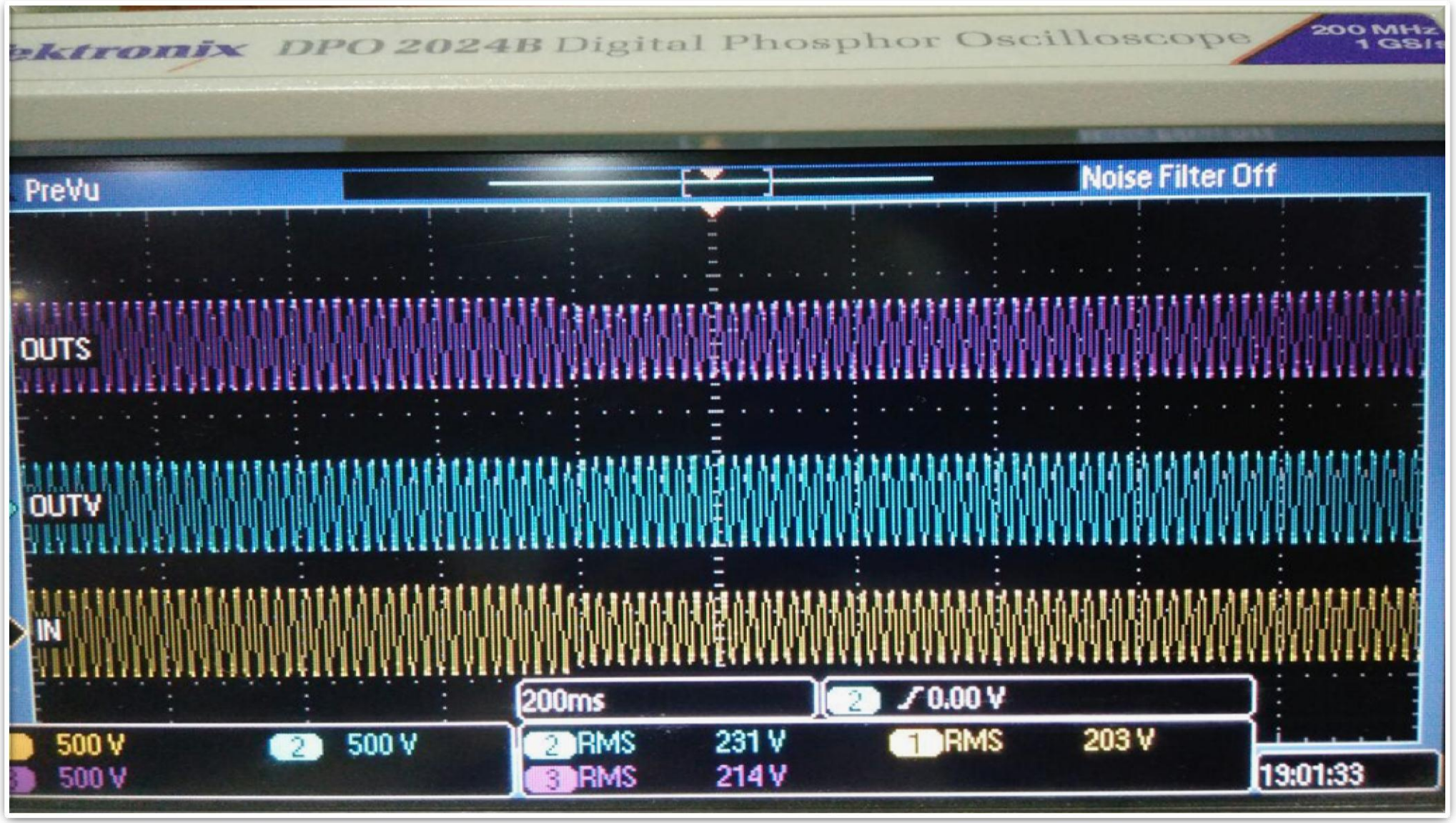
- ***These waves are captured on an oscilloscope and same can be witnessed by anyone, we have a demo set-up at our works.***
- ***Input thru a dimmer stat is given to a Sag/Swell generator and output of the Sag/Swell generator is given to a Servo as well as TSi-VRP:***
  - ***Yellow wave is the input to Servo as well as TSi-VRP.***
  - ***Violet color wave is output of Servo during Sag and after Sag.***
  - ***Blue color wave is output of VRP during Sag and after Sag.***
- ***You will observe that during Sag initially, Servo gives you low voltage and slowly starts increasing the voltage. And, as Sag disappears its gives you output even higher than the input.***
- ***However, in TSi-VRP output remains dead constant during and after the sag.***

Oscilloscope Readings

***OUTS** is Servo Output*

***OUTV** is VRP output*

***IN** is input to TSi-VRP & Servo*



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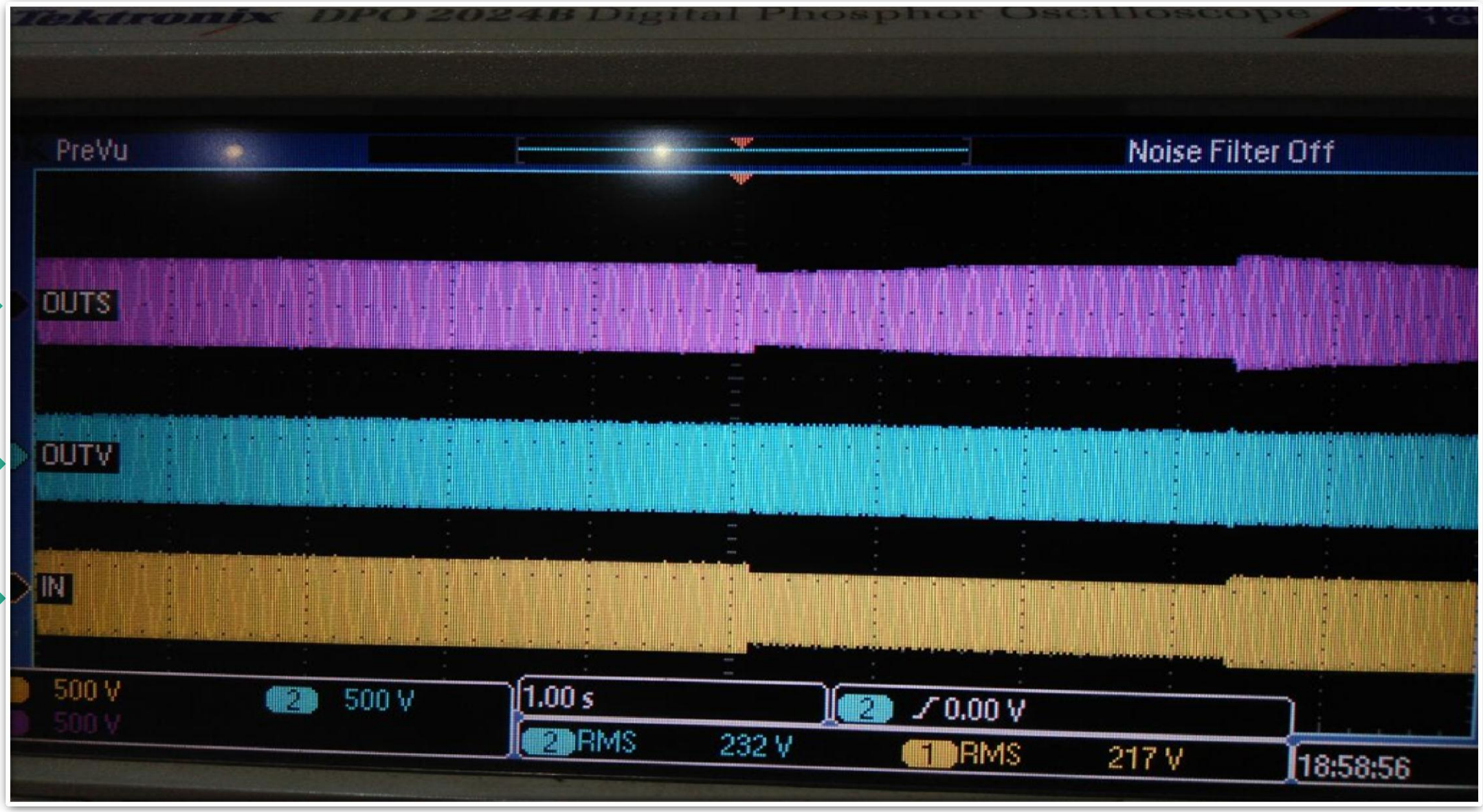
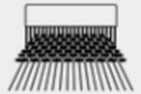


Applications Of TSi's Static Power Conditioner

CNC & Robotics

Auto & Auto Ancillary

Oil & Gas



Textile Spinning, Processing, Knitting, Weaving

Engineering Process Industry

Wood Cutting

Radar & Telecommunication

R&D, Testing, Diagnostics

Plastic Processing

Printing & Packaging

Security Surveillance

Building Management

Few Major Brands Who Have Reaped The Benefits Of TSi Technology

Overall, in the last 9 years we have developed a customer base of ***1300+***

Case Study: 10 Nos. of 200 KVA SVS Replaced With TSi-VRP @ A Japanese Company In Mumbai

When Servo Stabilizers Were Installed

After Installation Of TSi-VRP

TSi–VRP was able to correct the voltage much faster, along with the ability to handle sags/swells and over and above this, took 50% floor space as compared to earlier installed Servo Voltage Stabilizer

Case Study on Big Savings & Productivity Increase @ Hwashin Automotive

(Main body parts supplier for Hyundai Cars, Chennai)

HWASHIN AUTOMOTIVE INDIA PRIVATE LIMITED

28th November 2017

WHOMSOEVER IT MAY CONCERN

Proud to be a **FIRST CUSTOMER** in South India for **TSi Power Private Limited.**

Since 2004, HWASHIN INDIA had been prepared servo stabilizers for robot and welding application resulted repeated failure in robot's PCB since servo stabilizer's are fails to control immediate spike & surge voltages and similarly direct deliver the fluctuating voltage without control to the robot during failure/power cut since servo stabilizer's output response time has not been controlled.

Looking a better resolution for robot's PCB's failure due to servo stabilizer's ineffective, experimenting the STATIC CONTROL VRp can be overcome the fluctuation incoming power & supporting for certain frequency as well.

Unbelievable result's experienced from VRp and servo stabilizer's replace with VRp continues.

From 2012 to 2017..... More than 400 Units installed in HWASHIN INDIA.

We strongly recommend that, TSi VRp best resolution for fluctuation power and load (Weld area).

Detailed experience for your ref. below.

SUMMARY OF BENEFITS BY INSTALLING 400 VRP UNITS IN HWASHIN AUTOMOTIVE PLANTS AT SRIPERAMBADUR, CHENNAI, INDIA

S.No.	Particulars	Before installing the VRP	After installing the VRP	Remarks
1	Robot Failures	Average 4 hrs. failure/breakdown per week	Nil breakdown	After installation of TSI VRp, during the period of 2013 - 2015, annually nearly Rs. 2 million worth robot electronic cards' consumption reduced. In fact, robot card failure became nil and 4 hours down-time per week reduced. As a result, annual maintenance budget reduced from Rs. 70 million to Rs. 35 million and a productivity increased by 5%.
2	Cost of all spares, including control cards	Approx. Rs. 5 million per month	Approx. Rs. 3 million per month	
3	Annual Maintenance Costs of Plant Robot lines	Rs. 70 million	Rs. 35 million	
4	Consumer comfort	-	-	After 2015 Hwashin decided to use only VRp for power supply to machines. So, slowly started to replace all servo stabilizers in various plants by VRp. Now in 2017 end, Hwashin uses more then 400 3-phase VRp's in total 5 plants/ ancillaries.
5	Cost of Power	High, due to use of Servo with Step Down Isolation Transformer	Low, as step down Isolation Transformer is replaced by Auto Transformer which is much more efficient.	Servo Voltage Regulator gives birth to micro sparks due to which Servo people mandatorily ask to use IT at the output of Servo.

For HWASHIN AUTOMOTIVE INDIA PRVATE LIMITED

28/11/17

RAJAKUMR.V
Asst. Manager - New Projects
9842394959

Registered Office and Principal place of Business
Plot No. F-65A, SIPCOT Industrial Park, Irungattukottai
Sriperumbudur (Taluk), Kancheepuram (District),
Tamil Nadu - 602 117.
Phone - 044 47130000-29 Fax - 044 47132039

Additional Place of Business
Plot No. B9 & B10, SIPCOT Industrial Park, Irungattukottai
Sriperumbudur (Taluk), Kancheepuram (District),
Tamil Nadu - 602 117.
Phone - 044 47132000-29

CIN - U34300TN2002PTC048250

Remarks

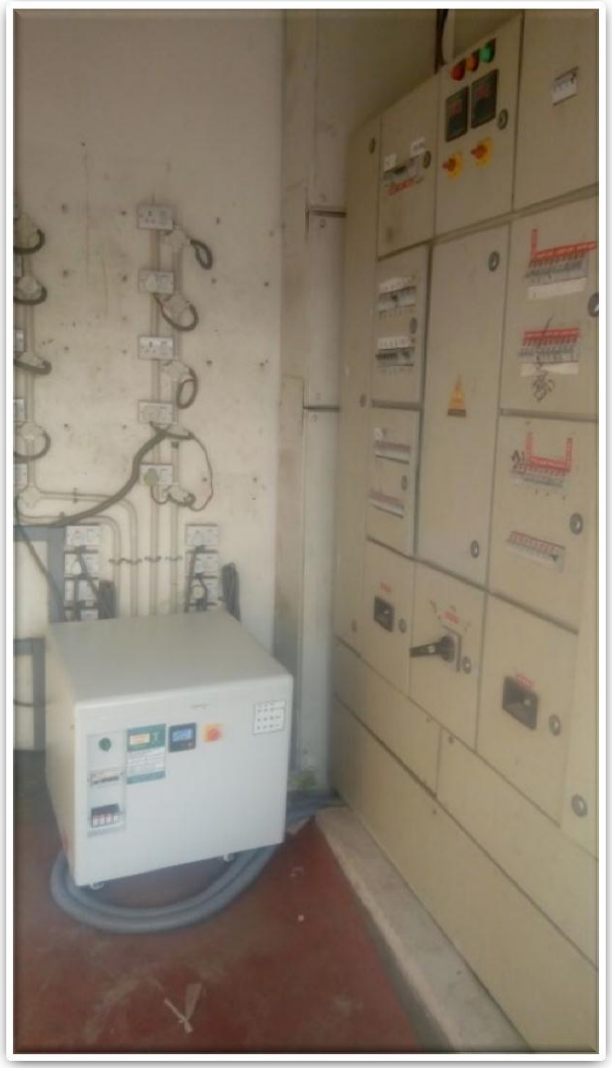
As a result, annual maintenance budget reduced from Rs. 70 million to Rs. 35 million and productivity increased by 5%.

**Now Using over 500 nos. Of TSi equipment in their 4 plants.*

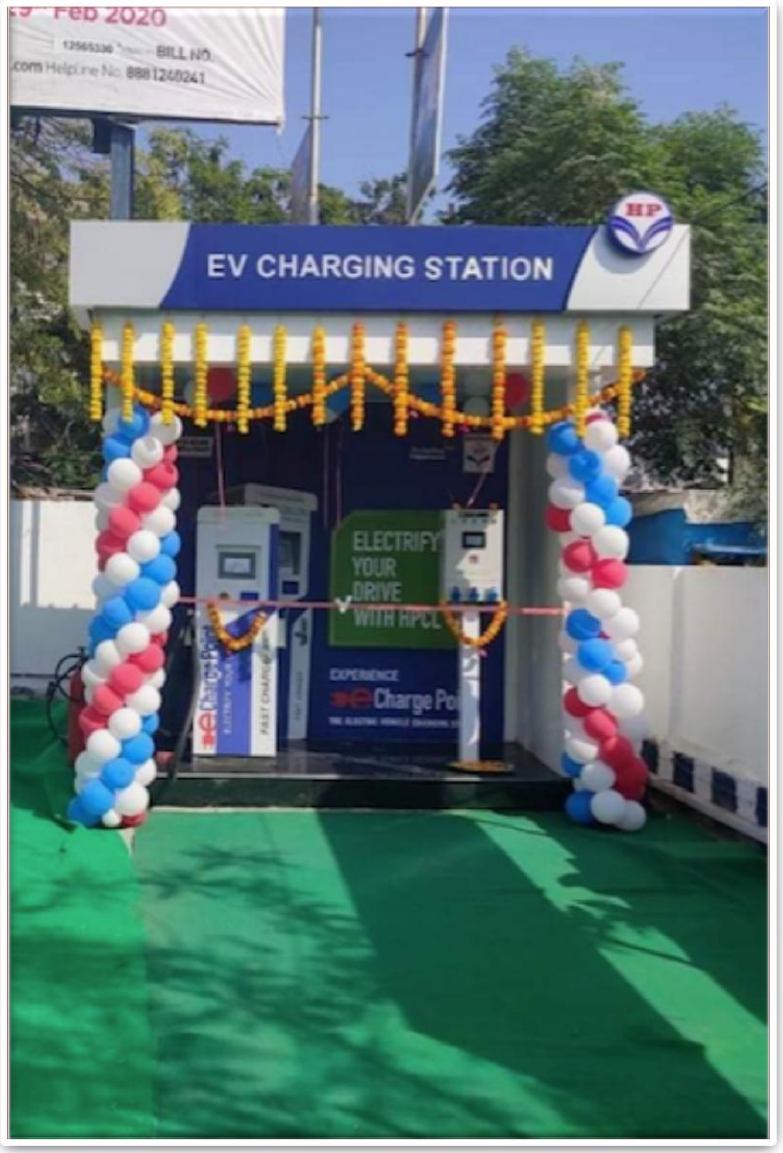
TSi Static Power Conditioner Installed At *HPCL Petrol Pump, Delhi*

Before Installation of TSi-VRP

After Installation Of TSi-VRP



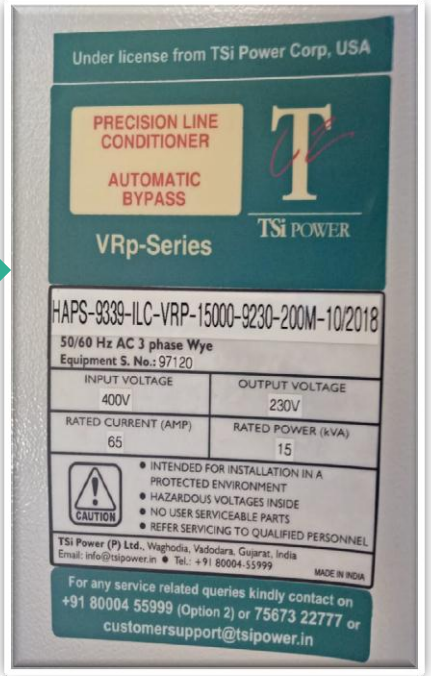
Vadodara's First HPCL *EV Charging Station Powered* By *TSi-VRP*



TSi-VRP HAPS Model Installed At Various *HPCL Petrol Pumps*

Before Installation Of TSi-VRP

After Installation Of TSi-VRP



Case Study: Kajaria Ceramics Replaces UPS By TSi Static Power Conditioner To Power Their Kiln

TAKE CHARGE OF YOUR POWER

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