TECHNICAL SOLUTIONS LLC

Power Solutions

Engineered energy, power quality, transformers, VSD, UPS and power protection solutions for critical infrastructure.

ttis.ly

- Energy Data Management
- Power Quality
- Custom Transformers
- VSD Pump Systems
- UPS & Power Protection

TECHNICAL SOLUTIONS LLC

A Coordinated Engineering Partner

Assess. Engineer. Deliver. Support.

Technical Solutions combines engineering, procurement, field execution, commissioning, training and lifecycle support into one coordinated delivery model.

Built for power, water, oil and gas, utilities, laboratories, industrial plants, commercial buildings and mission-critical infrastructure.

Assess

We evaluate your needs, assets and operating environment to define clear objectives and technical requirements.

Engineer

We design integrated power solutions with the right architecture, equipment selection and protection strategy.

Deliver

We procure, install and commission systems to the highest standards of safety, quality and reliability.

Support

We train your team and provide ongoing maintenance, remote monitoring and lifecycle support.

Power Is an Operational System

Reliable operations require power that is **measured, stable, protected, controlled** and **supported.**

Measure

Visibility through energy data and power quality analytics.

Stabilize

Maintain clean, stable power and improve power quality.

Transform

Right voltage, right capacity, right performance for the job.

Control

Optimize performance with intelligent control and variable speed systems.

Protect

Ensure continuity with backup power and protection solutions.

From utility energy data to critical backup power, every component must work together.

TECHNICAL SOLUTIONS LLC

Utility-Grade Energy Data Management

A unified platform for grid visibility, meter data and operational intelligence.

Collect, process, analyze and visualize energy data from field assets to support smarter utility decisions.

Vendor-Independent SCADA

Open standards, flexible integration and no vendor lock-in.

EDMS Module

Centralized data management, analytics and operational insights.

RTUs & Digital Meters

Robust field data acquisition with digital meters and RTUs.

Automated Meter Reading

Real-time meter data collection for accurate billing and visibility.

TECHNICAL SOLUTIONS LLC

EDMS Architecture

Field devices, communications, SCADA and decision support in one connected platform.

Meters

Digital Meters

Smart Meter

Revenue Meter

CT / PT Meter

Multi-Function Meter

RTUs

Remote Terminal Units

Communications

Cellular (4G/5G)

Satellite

Fiber Optic

Radio / LoRa

SCADA + EDMS

Central Platform

- Data Acquisition & Validation
- Real-time Monitoring & Alarms
- Events & Historian
- Analytics & Reports

Dashboards & Reports

Operations Dashboard

Reports & Analytics

Billing & Revenue Management

Decision Support

AMR

Automated meter reading for real-time data capture and accuracy.

Data Analysis

Advanced analytics and reports for smarter utility decisions.

Grid Monitoring

End-to-end grid visibility with real-time monitoring and alarm management.

Training & Support

Comprehensive training, documentation and ongoing technical support.

Open standards, scalable integration and real-time energy visibility.

TECHNICAL SOLUTIONS LLC

From Meter Readings to Grid Intelligence

A phased path from data collection to national-scale utility visibility.

Real-Time Consumption Data

Access live energy data for better decisions and planning.

Improved Meter Reading

Automated collection reduces manual effort, errors and delays.

Enhanced Billing Accuracy

Accurate, timestamped data drives fair billing and higher revenue.

Faster Issue Identification

Detect anomalies early and resolve problems faster.

Phased Deployment Roadmap

1

Platform

Deploy core SCADA and EDMS platform with secure architecture and user access.

2

Pilot RTUs

Integrate RTUs and meters in a pilot area to validate performance and communications.

3

Regional Expansion

Expand to new regions, add more assets and scale communication infrastructure.

4

Full Deployment

Nationwide rollout with full integration, analytics and operational excellence.

Training & Support

Onsite Training

Hands-on training at your sites with real equipment and systems.

Computer-Based Training

Interactive digital training modules at your pace, anytime, anywhere.

Certification

Structured programs with assessments and certified competence.

Maintenance & Support

Continuous technical support, updates and system maintenance.

Scalable implementation with handover, training and ongoing support.

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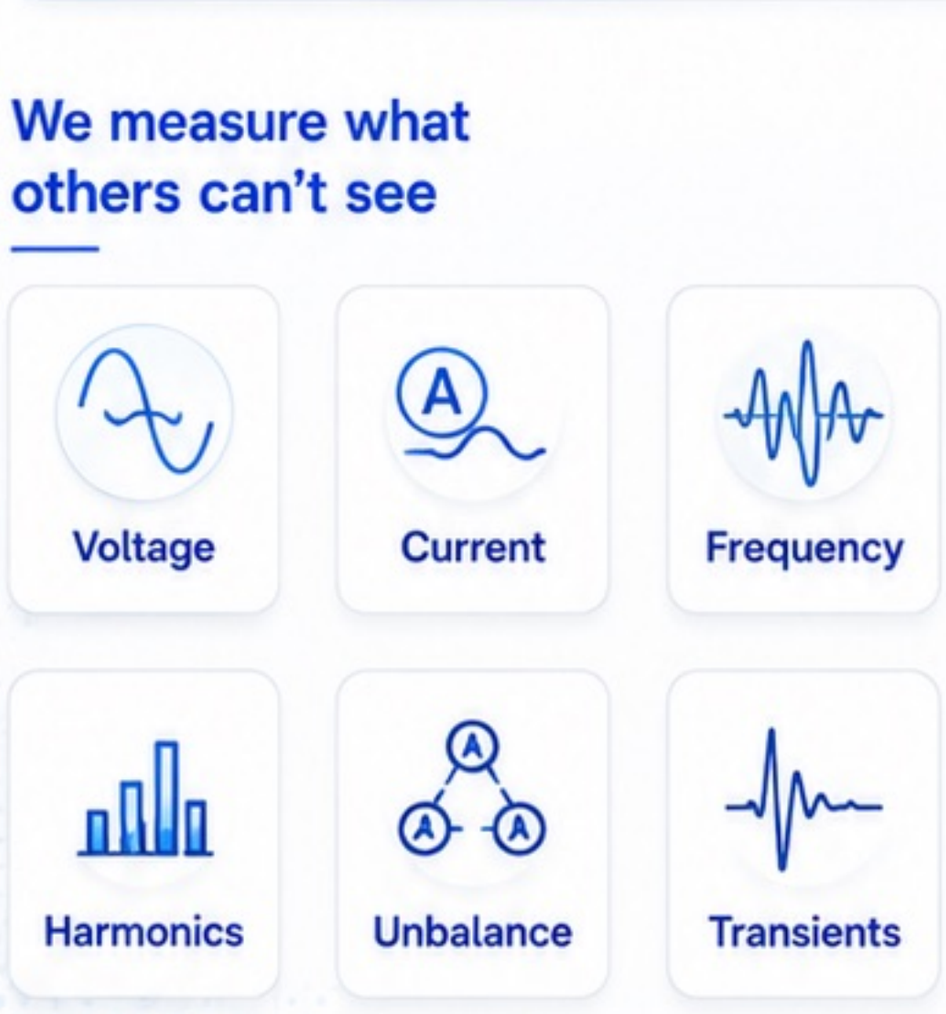
Power Quality Solutions

Measure the invisible problems that affect reliability, safety and equipment life.

Power quality is the electrical condition that allows equipment to operate as intended without significant loss of performance or life expectancy.

We measure what others can't see



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Typical Power Quality Problems

Voltage, current, frequency and waveform deviations can become operational risk.

Long-Duration Variations

(> 1 minute)

- Voltage Regulation
- Unbalance
- Harmonics
- Flicker
- Over / Under Voltage

Short-Duration Disturbances

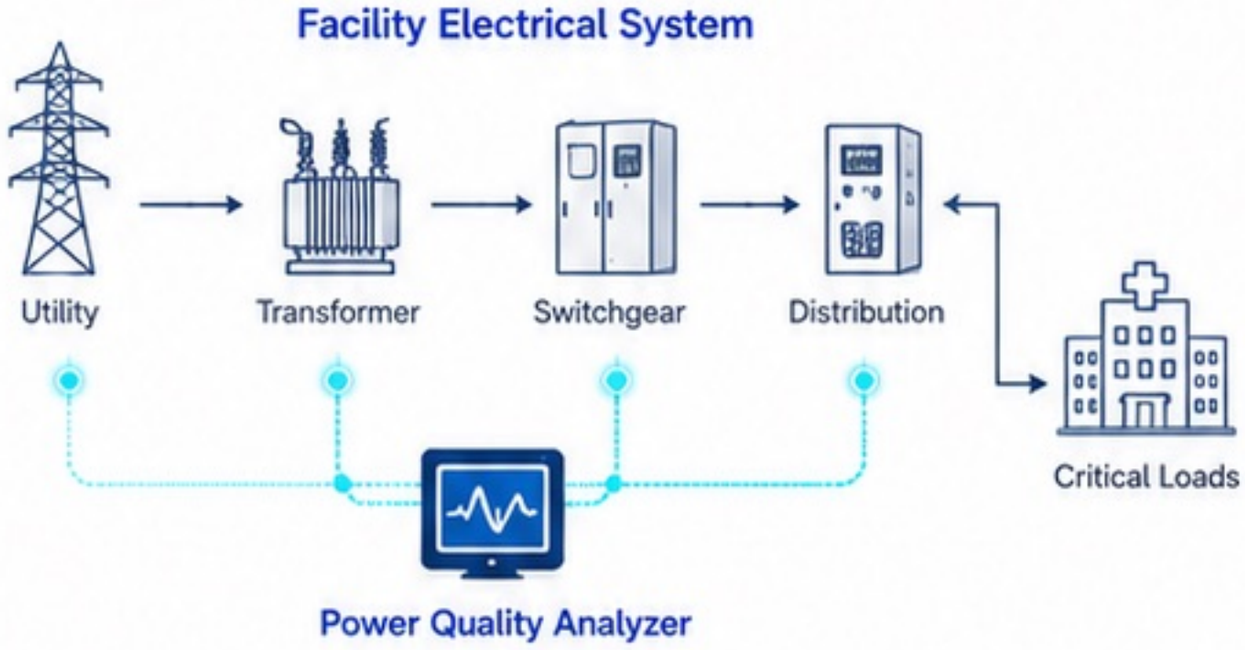
(< 1 minute)

- Sags
- Swells
- Transients
- Interruptions

Measurement is the Foundation

- Capture voltage, current and frequency events
- Identify the root cause of disturbances
- Quantify impact on critical equipment
- Support informed corrective actions

Facility Electrical System



Correct diagnosis starts with measurement.

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Power Quality Service Packages

Audit, diagnose, correct, train and support.

PQ Audit

- Full Audit
- Targeted Audit
- Realtime Auditing

PQ Solutions

- Implementation
- Supervision
- Consulting

Training

- In-House
- Traditional
- Remote

Site Survey → Measurement → Report → Recommendations → Implementation

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Power Quality for Critical Facilities

Protect sensitive equipment, critical processes and human safety.

Healthcare

Protect medical equipment, diagnostics and life-support systems.

Laboratories

Ensure accurate results and continuous operation of sensitive instruments.

Control Rooms

Maintain reliable monitoring, automation and critical decision systems.

Data & IT Rooms

Safeguard servers, networks and data from power disturbances.

- **Malfunction**
- **Data Loss**
- **Equipment Lockup**
- **Procedure Interruption**
- **Downtime**

Sensitive loads require power that is measured, stable, filtered and protected.

Protect People
Reduce risk to patients, staff and operations.

Protect Equipment
Extend equipment life and reduce failure risk.

Protect Performance
Maintain accuracy, quality and process continuity.

Protect Investment
Lower total cost through reliability and uptime.

Protect Compliance
Meet standards and regulatory requirements.

TECHNICAL SOLUTIONS LLC

Custom Power Transformers

Built around the pump, the site and the duty.

For high-voltage water and oil pump systems.

Voltage Stability

Maintains stable voltage under varying load and grid conditions.

Motor Starting Support

Handles high inrush current and supports smooth, reliable starts.

Harsh-Site Reliability

Designed for high ambient temperatures, dust, corrosion and demanding environments.

Transformer selection must match the drive, cable, motor, protection and operating environment.

TECHNICAL SOLUTIONS LLC

Transformer Engineering Scope

Designed for voltage stability, VSD compatibility and field reliability.

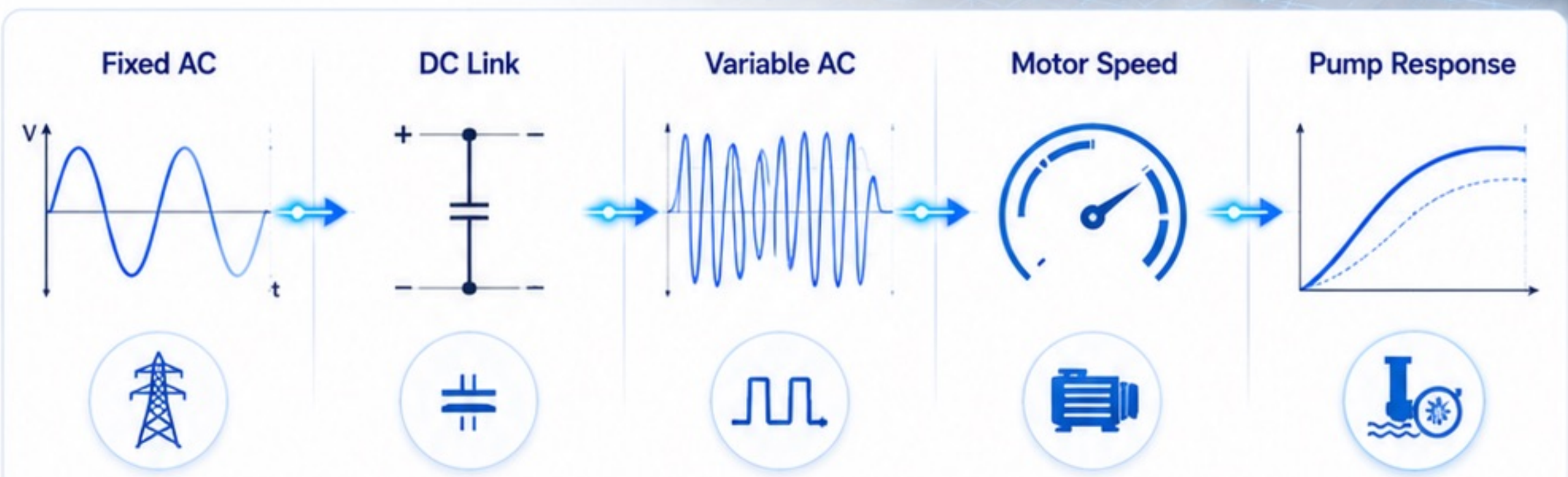
- Voltage Ratio
- kVA / MVA Sizing
- Impedance
- Cooling
- Protection
- Earthing

For deep wells, the transformer must be engineered with the VSD, filter, cable and motor.

TECHNICAL SOLUTIONS LLC

VSD / VFD Systems for Water and Oil Pumps

Controlled speed, controlled starting and better pumping performance.



What the Drive Controls

Pressure
Maintain discharge pressure within a set range.

Flow
Match pump output to demand and improve efficiency.

Level
Coordinate with tank, sump or well level conditions.

Speed Ramp
Control acceleration and deceleration to reduce shock.

Protection
Protect against dry run, overload, UV, phase loss and more.

Visibility
Monitor current, power, frequency, events and trends.

A VSD is both a motor starter and a process-control platform.

TECHNICAL SOLUTIONS LLC

Deep-Well Pumping and ESP Applications

Long cables, high starting current and remote sites require system-level engineering.

High Starting Current

Direct-on-line starting can draw 6–8x full-load current, stressing transformers and switchgear.

Voltage Drop

Long cables and high current cause voltage drop, reducing motor torque and increasing heating.

Water Hammer

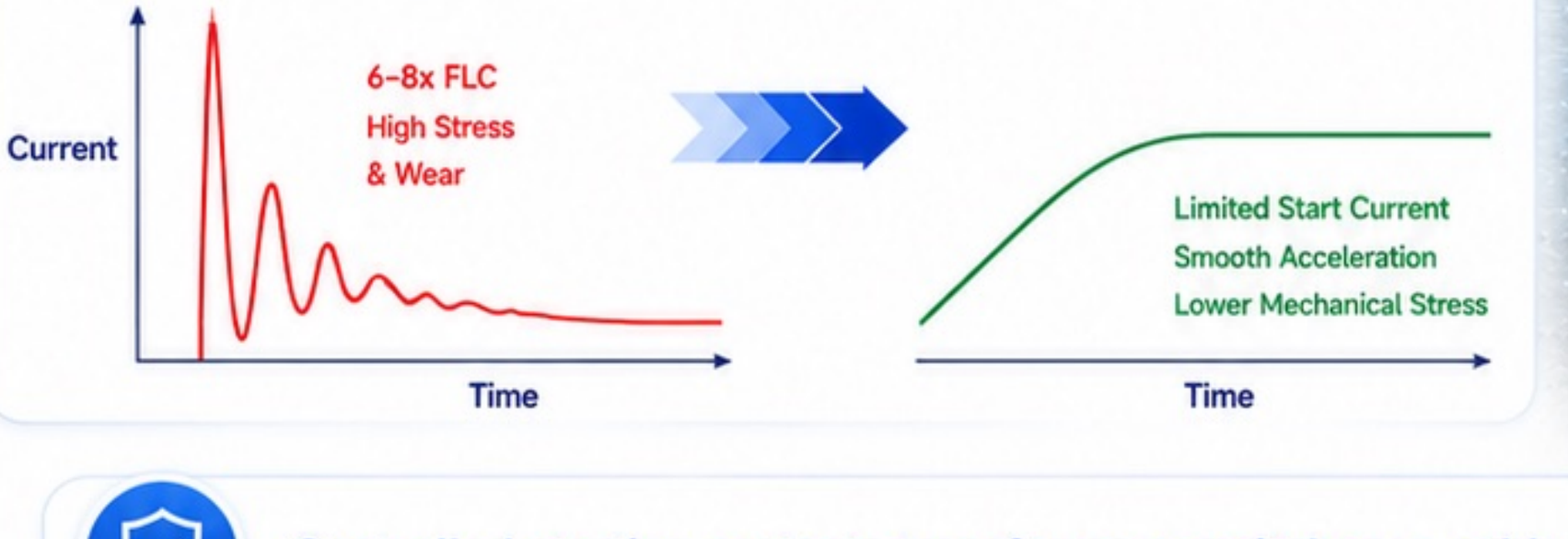
Rapid starts and stops create pressure surges that can damage pipes, valves and well equipment.

Insulation Stress

High dV/dt, long cables and reflections can accelerate motor insulation aging and failures.

UBWM 310 Example:

251 kW	380 V	481 A FLC	Approx. 2.9 kA DOL Start



Controlled starting protects transformers, switchgear, cables and pump motors.

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Reliability, Efficiency, Protection and Field Visibility

A modern VSD turns the pump drive into a telemetry node.

- Reliable Connectivity
- Secure Data
- Always On Visibility

Soft Start

Reduces inrush current and mechanical stress on the system.

Process Matching

Adjust speed to meet demand and optimize pressure and flow.

Built-In Protection

Protects against dry run, overload, voltage issues and other faults.

Remote Monitoring

Monitor performance, events and alarms from anywhere.

REMOTE PUMP DASHBOARD

Current

Voltage

Power

Frequency

Alarms

1

Active Alarm

Trip History

3

Last 7 Days

Drive + Telemetry + SCADA = fewer site visits and faster response.

TECHNICAL SOLUTIONS LLC

UPS and Power Protection Solutions

Continuous, clean and stable power for critical loads.

Built for mission-critical environments

Commercial Facilities

Protects business operations, IT systems, lighting and critical equipment from power disturbances.

Government Buildings

Ensures continuous power for essential services, communications and public infrastructure.

Healthcare

Safeguards life-support equipment, patient care systems and sensitive medical devices.

Laboratories

Protects precision instruments, research equipment and experiments from power quality issues.

End-to-end power protection

Utility / Generator

Voltage Regulator

Online UPS

Distribution Panel

Critical Loads

- IT Systems
- Medical Equipment
- Laboratory Instruments

Stabilize incoming voltage, condition power and maintain continuity during outages.

TECHNICAL SOLUTIONS LLC

Modular Online UPS + Voltage Regulation

Layered protection for sensitive and mission-critical loads.

- High Reliability
- Max Efficiency
- Battery Autonomy
- Smart Management

Modular Online UPS

Double Conversion
True online double conversion for clean and reliable power.

Scalable Design
Add power modules as demand grows. No single point of failure.

Battery Backup
Instant backup powers critical loads during outages.

Monitoring
Real-time monitoring, events, alarms and remote visibility.

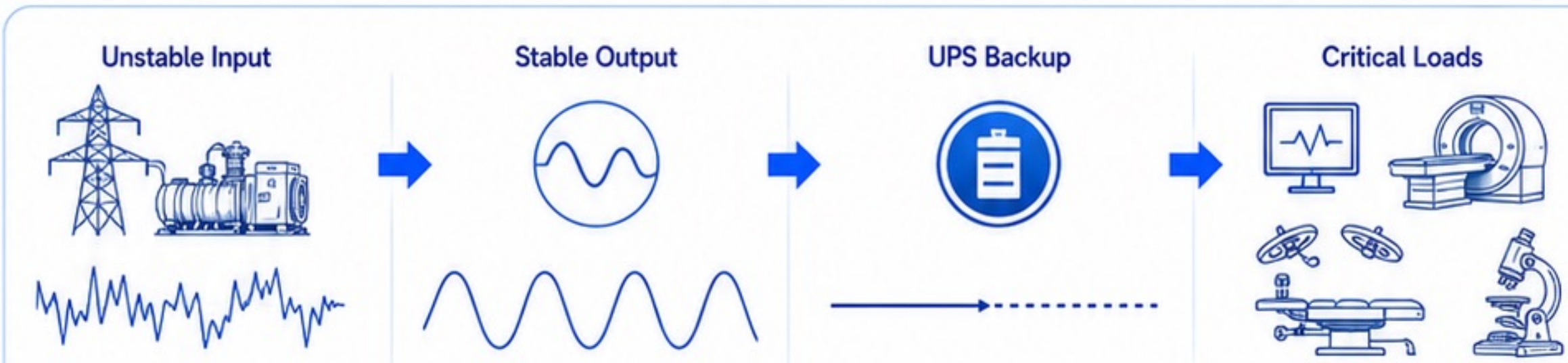
Servo Voltage Regulator

Stable Output
Delivers clean, stable voltage to protect sensitive equipment.

Fast Regulation
High-speed servo control corrects fluctuations quickly.

Independent Phase Control
Three-phase balancing ensures optimal voltage quality.

True RMS Measurement
Accurate true RMS sensing for precise regulation.



TECHNICAL SOLUTIONS LLC

Implementation Methodology

One coordinated delivery flow from assessment to lifecycle support.

01 Assess — Understand site conditions, objectives and performance needs.

02 Engineer — Design the optimal solution with power quality, protection and integration in mind.

03 Supply — Deliver high-quality equipment from trusted manufacturers.

04 Install — Professional installation aligned with design and site standards.

05 Commission — Test, validate and optimize system performance on site.

06 Train — Equip your team with the skills to operate and maintain with confidence.

07 Support — Ongoing technical support, remote monitoring and lifecycle maintenance.

Every solution is selected for performance requirements, site conditions, integration needs and long-term maintainability.

Site Survey · System Design · Procurement · Testing & Handover

TECHNICAL SOLUTIONS LLC

Power Solutions for Critical Infrastructure

Engineered for utilities, oil and gas, water systems, healthcare, laboratories, commercial and governmental operations.

Utilities

Reliable generation, transmission and distribution for a stable power grid.

Oil & Gas

Robust power solutions for upstream, midstream and downstream operations.

Water Infrastructure

Efficient pumping, treatment and distribution for mission-critical water systems.

Healthcare

Continuous, clean power for patient care and life-support systems.

Laboratories

Precision power for sensitive instruments and research environments.

Government

Secure and dependable power for public services and critical facilities.

Commercial

Resilient power for businesses, data centers and commercial complexes.

Reliable power architecture for real-world operating conditions.

TECHNICAL SOLUTIONS LLC

Build a Smarter, More Reliable Power Infrastructure

Technical Solutions brings energy data, power quality, transformers, VSD systems, UPS and power protection into one coordinated engineering approach.

Reliability. Efficiency. Protection. Control.

Engineering-led delivery for critical operations.

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