



PowerPro™

Engineering Design & Specification Guide

Engineering Better Power Systems

For consulting engineers, facility owners,
and electrical system designers

CFT POWERPRO

POWER QUALITY

ENERGY SAVINGS

Power quality optimization
Harmonic mitigation
Power factor support
M&V ready

Power Quality Optimization | Harmonic Mitigation | Power Factor Support | M&V Ready

Prepared by CFT Energy Saving Solutions | PowerPro is supplied as part of an engineered CFT power-quality program

CFT Energy Saving Solutions | www.cftenergysavings.com



Why Engineers Specify PowerPro

A compact power-quality optimization approach for facilities with nonlinear loads, VFDs, sensitive electronics, and high utility costs.

Utility Cost Impact

Poor power quality can increase losses, demand, equipment heating, nuisance trips, and avoidable maintenance.

Engineered Retrofit

Applied at service entrances, distribution panels, MCCs, or major equipment groups.

Power Quality Support

Targets harmonics, voltage disturbances, poor power factor, and transient events where justified.

M&V Ready

Evaluated with before/after measurements and utility billing data.

Typical Applications

Hotels

Hospitals

Universities

Municipal

Manufacturing

Wastewater

Commercial

Data Centers

CFT Engineering Role

Utility bill analysis, site survey guidance, solution selection, contractor coordination, commissioning, and measurement & verification.

Engineering Positioning

PowerPro should be specified as part of a measured, engineered power-quality program — not as a generic plug-in product.

The Engineering Problem

Modern facilities combine VFDs, electronic power supplies, HVAC equipment, lighting controls, elevators, kitchens, and IT loads on the same distribution system.

Nonlinear Loads

VFDs, rectifiers, UPS systems, LED drivers, and electronic loads draw current in pulses instead of a pure sine wave.

Harmonics

Distorted current and voltage can create heating, losses, nuisance trips, transformer stress, and neutral stress.

Poor PF

Reactive and distortion power can increase apparent power and reduce usable electrical capacity.

Transients

Switching, motor starts, lightning, and utility events can stress equipment and controls.

Voltage Issues

Sags, swells, imbalance, and excessive voltage variation reduce reliability and efficiency.

Heat & Losses

Distribution losses appear as avoidable heat in conductors, transformers, switchgear, and motors.

Engineering Guidance

Measure before specifying equipment. Identify nonlinear load concentration and VFD horsepower. Review bills, one-lines, transformer ratings, and power-quality studies before selecting a correction strategy.



The PowerPro Engineering Solution

PowerPro is an engineered power-quality and energy-savings solution. Design begins with measured site conditions, not a one-size-fits-all assumption.

Harmonic Mitigation

Reduces distortion and related losses where measurements justify correction.

POWERPRO Power Quality + Energy Savings

Power Factor Support

Improves apparent-power performance and capacity when tariff and load data justify.

Surge & Transient Defense

Adds protection for sensitive controls and equipment exposed to harsh electrical events.

Measurement & Verification

Supports before/after tracking using meters, utility bills, and commissioning records.

Design Principle

Select and locate PowerPro based on distribution architecture, load profile, harmonic measurements, utility tariff, available space, and maintenance access.

Typical Installation Arrangement

Locate PowerPro where it treats the target problem without creating coordination or maintenance issues. Final location must be confirmed by engineering review.



Preferred Location

As close as practical to the target bus or load group while preserving safe service access.

Contractor Scope

Licensed electrical contractor installs per drawings, NEC, local code, and manufacturer instructions.

Commissioning

Verify wiring, protection, grounding, power-quality readings, and operating status before acceptance.

Location Approval Checklist

Review available fault current, overcurrent protection, conductor routing, enclosure rating, heat dissipation, shutdown windows, and maintenance clearance.



Engineering Assessment Requirements

PowerPro selection should be based on a practical engineering review using utility data, electrical drawings, and measured power-quality conditions.

Utility Data

12–24 months of electric bills, interval demand data where available, tariff, kW, kWh, PF penalties, and demand charges.

Electrical Drawings

One-lines, switchgear/MCC schedules, panel schedules, transformer ratings, generator/ATS information, and grounding approach.

Load Inventory

Major VFDs, HVAC equipment, pumps, elevators, UPS systems, kitchen equipment, chargers, and nonlinear load concentrations.

Measurements

Voltage, current, kW, kVA, PF, THD-V, THD-I, harmonic spectrum, imbalance, sags/swells, and event logs.

Site Conditions

Available space, enclosure type, ambient temperature, ventilation, maintenance access, conduit route, and shutdown windows.

Economic Screen

Savings opportunity, reliability benefit, utility tariff impact, installation cost, and measurement-and-verification plan.

Engineering Rule

Measure the electrical problem first; then select the correction strategy.



Application & Sizing Guidance

Use this page as a screening guide. Final PowerPro selection should follow CFT review of electrical data, measurements, utility rates, and site constraints.

Condition	Engineering Response	Key Checks
High VFD concentration	Evaluate harmonic mitigation and bus-level treatment.	THD-I, THD-V, VFD HP, transformer kVA
Poor PF or kVA stress	Evaluate PF support only where tariff and system data justify.	PF, kW/kVA, capacitor conflicts
Sensitive electronics	Evaluate transient protection and voltage stability needs.	Events, grounding, UPS interactions
Transformer/panel heating	Measure current distortion and loading before/after.	Thermal scans, neutral current, THD
Wastewater or pumping	Focus on MCCs, large VFDs, pump cycles, and process uptime.	Motor loads, runtime, SCADA trend data

Sizing Note

Sizing is not based on connected load alone. It depends on measured distortion, operating load, distribution location, available capacity, and economic value of correction.

Performance Screening & Measurement

Screening values help prioritize opportunities, but final savings depend on measured site conditions, runtime, utility tariff, and installation scope.

Screening Range

5–12%

typical screening range

University

9%

university example

Hotel

9%

hotel example

Target Payback

12–24 mo.

target payback screen

Hospitals

5%

typical screening savings

Wastewater

6–13%

typical screening savings

Data Centers

7%

typical screening savings

Baseline

Collect utility bills, demand data, runtime schedules, operating conditions, and power-quality measurements before installation.

Post-Install

Repeat measurements under comparable load conditions and track utility results over a defined verification period.

KPIs

kWh, peak kW, kVA, PF, THD-V, THD-I, voltage events, temperature, nuisance trips, and equipment reliability.

Reporting

Summarize baseline, scope, installation date, operating assumptions, measured changes, and utility bill impact.

Important

Savings are not guaranteed by this guide. CFT evaluates each opportunity using site-specific data.



CSI SECTION 26 35 33 - POWER QUALITY OPTIMIZATION SYSTEMS

Basis of Design

PowerPro™ power-quality optimization system supplied by CFT Energy Saving Solutions.

Performance Intent

Reduce avoidable electrical losses, mitigate harmonic effects, improve power-quality conditions, and support M&V.

Design Inputs

Utility billing data, electrical one-lines, load inventory, power-quality measurements, site conditions, and utility tariff.

Installation

Install by licensed electrical contractor per approved drawings, NEC, local code, and manufacturer instructions.

Startup / Testing

Verify connections, protective devices, grounding, status indicators, power-quality measurements, and M&V baseline records.

Closeout

Submit product data, drawings, commissioning report, measurement records, warranty, and O&M documentation.



SECTION 26 35 33 - POWER QUALITY OPTIMIZATION SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish and install power-quality optimization equipment and accessories as shown on drawings and as specified herein.
- B. Applications include commercial, institutional, hospitality, municipal, industrial, and wastewater facilities.

1.02 RELATED SECTIONS

26 05 00 - Common Work Results for Electrical; 26 24 13 - Switchboards; 26 24 16 - Panelboards; 26 29 23 - Variable Frequency Motor Controllers.

1.03 REFERENCES

- A. NFPA 70, National Electrical Code.
- B. IEEE 519, Recommended Practice and Requirements for Harmonic Control in Electric Power Systems.
- C. Applicable local codes and utility requirements.

1.04 SUBMITTALS

Product data, shop drawings, ratings, enclosure data, wiring diagrams, installation instructions, commissioning plan, warranty, and O&M manuals.

1.05 QUALITY ASSURANCE

Installation shall be performed by a licensed electrical contractor experienced with distribution equipment and power-quality systems.

1.06 BASIS OF DESIGN

PowerPro™ supplied by CFT Energy Saving Solutions. Substitutions require engineering review and documented equivalency.



PART 2 - PRODUCTS

2.01 POWER QUALITY OPTIMIZATION SYSTEM

Provide a system configured for the project electrical distribution arrangement and measured site conditions.

2.02 PERFORMANCE REQUIREMENTS

- A. Suitable for service voltage, phase, frequency, available fault current, enclosure location, ambient temperature, and connected load profile.
- B. Coordinate with existing switchgear, MCCs, panelboards, VFDs, generators, transfer switches, and protective devices.
- C. System shall support measurement and verification of electrical parameters before and after installation.

2.03 RATINGS AND ENCLOSURE

Provide voltage, current, short-circuit, and environmental ratings appropriate for the installation. Enclosure type shall match indoor/outdoor and service-area requirements.

2.04 ACCESSORIES

Disconnects, overcurrent protection, conduit, wire, lugs, labels, grounding conductors, communications wiring, and metering accessories as required by the approved design.

2.05 DOCUMENTATION

Include equipment data sheets, wiring diagrams, recommended maintenance, commissioning checklist, and warranty documentation.



PART 3 - EXECUTION

3.01 EXAMINATION

Verify service voltage, load conditions, available installation space, grounding, protective devices, shutdown constraints, and maintenance access before installation.

3.02 INSTALLATION

Install PowerPro equipment per approved drawings, manufacturer instructions, NEC, local code, and utility requirements. Maintain clearances and labeling.

3.03 STARTUP

Verify mounting, terminations, grounding, protective devices, status indicators, and operating conditions before energizing.

3.04 FIELD QUALITY CONTROL

Record voltage, current, kW, kVA, PF, THD-V, THD-I, temperature, and status under representative operating conditions.

3.05 OWNER TRAINING

Provide training covering operation, safety, inspection, maintenance access, documentation, and measurement & verification process.

3.06 CLOSEOUT

Submit product data, shop drawings, commissioning report, measurement records, warranty, and O&M manuals. END OF SECTION 26 35 33.

CFT Engineering Services

Product evaluation and application review • Utility bill analysis • Engineering support • Specification assistance • Contractor coordination • Installation support • Commissioning • Measurement & verification