



Content
Community
Connection

United States
The Electricity Forum Inc.
742 Pre Emption Road
Geneva, NY 14456
Tel 289-387-1025

Canada
The Electricity Forum
1885 Clements Rd, Unit 218
Pickering, ON L1W3V4
Tel 905-686-1040
Fax 905-686-1078
Toll Free 855-824-6131

3-Day Power Quality Analysis and Power Factor Training

Course details: <https://electricityforum.com/electrical-training/3-day-power-quality-training>

COURSE DATES AND TIMES

Power Quality Training - Our 3 day (18 hours) live online instructor-led course is actually a series of three courses:

1. [Power Quality Analysis Training](#)
2. [Power Factor Training](#)

1. Power Quality Analysis Training - This 12-hour live online instructor-led course is important because power quality and harmonics analysis, measurement, and mitigation of electrical disturbance is no longer an option in our modern electronic society, it is a necessity. The course is designed to help organizations to recognize power quality problems by their symptoms and waveforms and to understand the root causes of electrical power quality problems as well as typical remedies.

Course Details Here:

[Power Quality Analysis Training](#)

2. Power Factor Correction Training - Our 6-hour live online instructor-led course explains the three types of power factor, from a cause and effect basis and then teaches the intricacies of each type along with the methods to improve each power factor. The course demonstrates how to size power factor capacitors for various types of situations and the pitfalls to be avoided. Several real life examples are worked as a group to demonstrate the techniques used to perform analysis of power factor, size power factor equipment and to quantify the expected results and ROI.

Course Details Here:

[Power Factor Training](#)

WHO SHOULD ATTEND

- Industrial, Commercial, Institutional Electrical Engineers, And Electrical Maintenance Personnel
- Consulting Electrical Engineers
- Project Engineers
- Design Engineers
- Field Technicians
- Electrical Technicians
- Plant Operators
- Plant Engineers
- Electrical Supervisors
- Managers In Charge Of Plant Electrical Infrastructure

STUDENTS RECEIVE

- This Course Includes Our Latest Power Quality And Grounding Handbook!! (Value \$20)
- **\$100 Coupon** Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.8 Continuing Education Unit (CEU) Credits (24 Professional Development Hours)
- **FREE** Magazine Subscription (Value \$25.00)
- Course Materials In PDF Format

COURSE OUTLINE

Day One and Two - Power Quality Analysis Training Course

Instructor

John Houdek, Power Quality Consultant, The Electricity Forum

DAY ONE

POWER QUALITY DISTURBANCES

- Typical Disturbances

- Disturbances associated with motor control applications
- Voltage quality

VOLTAGE SAGS

- Across the line motor starting
- What are effects of voltage sags
- Motor inrush current
- Flat – topped voltage
- Preventing Voltage sags
- Soft starting with VFDs, RVSS

POWER FACTOR

- Fundamental Frequency Power Factor
- Causes of low power factor
- What are effects of low power factor
- Motor currents
- Power factor vs energy savings
- Improving Power Factor
- Selection methods for power factor capacitors
- Cost of low power factor
- Locating PF capacitors
- Capacitor applications issues
- Best practices

VOLTAGE TRANSIENTS

- Sources of transients
- What are effects of transients
- Capacitor switching transients
- Effects of Transients on drives
- Voltage notching
- Best practices

DAY TWO

HARMONICS

- What is harmonic distortion and what does it look like?
- What are effects of harmonics
- Causes of harmonic distortion
- Power system reactance – effect on harmonics
- AC-DC Rectifier types
- Problems caused by harmonics
- Harmonics vs energy loss
- Harmonic Voltage distortion & effect on circuit elements
- Capacitors vs harmonics
- Harmonic resonance

- IEEE-519-2014 harmonic distortion limits
- Analyzing harmonic distortion
- Remedies for harmonic distortion
- Line reactors
- Tuned harmonic filters
- Wide band harmonic filters
- Multi-pulse drives
- Active filters
- Filter for grid connected inverters
- Symptoms of harmonics
- Best practices

PWM Voltage effects on motors

- PWM effects on motor temperature
- What are effects of PWM Voltage
- PWM voltage when motors have long cables
- Motor bearing currents
- Remedies for PWM motor issues

EMI / RFI

- Definition of EMI and RFI
- What are effects of EMI/RFI
- Equipment vulnerable to EMI
- Causes of EMI
- EMI propagation methods
- Measuring common mode current
- Remedies for EMI
- Best practices

Cautions for Retrofits

- Starter to VFD upgrades
- LED lighting upgrades
- Best practices

Waveforms & Measurements

Day Three - Power Factor Correction Training

Instructor - *John Houdek, Power Quality Consultant, The Electricity Forum*

Introduction to Power Factor

- Definition Of Power Factor
- Benefits Of High Power Factor
- Problems With Low Power Factor
- Types Of Power Factor

Fundamental Frequency (Displacement) Power Factor

- Motor Currents And PF
- Typical PF By Industry
- Lagging (Inductive) Current
- Leading (Capacitive) Current
- How Much Capacitance To Add
- Harmonic Resonance
- Detuning Capacitors To Avoid Resonance
- Capacitor Boosting (Voltage, KVAR, Current)
- Local Vs. Centralized Capacitors
- Fixed Vs. Automatic PF Capacitor Systems
- Capacitor Switching Device Ratings
- Cost Of Low Power Factor

Distortion Power Factor

- Estimating Distortion PF Based On Harmonic Current Distortion
- Causes Of Low Distortion Power Factor (Harmonic Distortion)
- Typical Current Distortion By Equipment
- What Does Harmonic Current Distortion Look Like?
- Improving Distortion PF

Total (true rms) Power Factor

- Function Of Both Displacement And Distortion PF
- Best Practices
- Decisions To Be Made About Total PF

Questions and Answers

COURSE SCHEDULE:

All Days days:

Start: 10 a.m. Eastern Time

Finish: 4:30 p.m. Eastern Time

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://electricityforum.com/onsite-requestforquote>