

RULES FOR ELECTRIC METER & SERVICE INSTALLATIONS



RULE 33

- (a) PPL EU Does Not Claim to Provide Disturbance Free Power
- (b) Customer Selects Power Conditioning Equipment
- (c) PPL EU Recommendations
- (d) Point of Use Tank Less Water Heaters
- (e) Power Quality
- (f) Harmonics
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RULE 33 — CUSTOMER'S EQUIPMENT — QUALITY OF POWER

a. **PPL EU Does Not Claim to Provide Disturbance Free Power:**

PPL EU does not claim to provide power to its customers which is free from impulses, sags, surges or noise.

Power line disturbances result from many factors, and should generally be expected to be present on the utility power distribution system. There is little PPL EU can do to eliminate most power line disturbances.

Many of the disturbances seen by the customer's equipment are caused either by the affected customer, by other customers connected to the same service system or by the normal operation of equipment on the utility distribution system.

If the Customer requires disturbance free (conditioned) power for their equipment, it is the Customer's responsibility to provide the necessary conditioning at the Customer's expense.

b. **Customer Selects Power Conditioning Equipment:**

Customers should determine the criticality of their operations and then select the necessary power supply conditioning equipment to meet their requirements.

Equipment such as surge and transient suppressors, filters, isolation sets, uninterruptible power supplies and magnetic power synthesizers are available to mitigate power line disturbances. Customers should contact their equipment provider for availability and type of power conditioning equipment needed for their installation.

c. PPL EU Recommendations:

Additionally, PPL EU recommends that the customer:

- Not be totally dependent on computer availability — have alternatives or a backup system.
- Not use computer equipment during thunderstorms.
- Disconnect computer equipment when not in use.
- Install lightning arrestors or surge protection at the service entrance panel.
- Use proper grounding techniques.
- Reduce static electricity when possible.
- Use a separate branch circuit for computer equipment if possible.
- Be aware that computers themselves can generate interference.
- Purchase battery backed up digital equipment and appliances.
- Purchase standby power supplies for computers and other consumer electronics that will reset during a momentary power interruption.

d. Point Of Use Tank Less Water Heaters:

Electric water heaters served hereunder must be equipped with thermostatically controlled non-inductive heating elements so connected that not more than 5500 watts can be operated at one time. PPL EU reserves the right to install necessary devices to control the operation of electric water heaters at its option.

PPL EU is not responsible for unsatisfactory service resulting from the operation of such water heaters installed by the customer without consulting PPL EU. The customer will be responsible for paying all costs to change PPL EU facilities to serve the system or to correct any problems that are created by the installation of the Tank Less Water Heater.

e. Power Quality:

For information on PPL EU's Power Quality Criteria refer to Sections M.1a through M.1e of the Facility Connection Requirements (Standard FAC – 001 – 0). **See:**
<http://www.pplelectric.com/NR/rdonlyres/F3F8BF4A-FCB9-43D2-BBDD-A452352B33CC/0/MatrixReferenceMaterial.pdf>

f. Harmonics:

Excessive harmonic distortion interferes with the performance of both utility and customer equipment. Excessive distortion of the system voltage will be prevented by limiting the harmonic currents that may enter the PPL EU system due to connecting proposed customer equipment. The acceptable amount of harmonic currents due to a proposed load will be determined by the amount of harmonic voltage distortion that the currents will produce.

g. Harmonics: Criteria to Limit Voltage Distortion Due to Single Customer

Total harmonic voltage distortion from all sources should not exceed 5 percent anywhere on the system to ensure proper operation of customer and utility equipment. To maintain distortion below 5%, harmonic currents due to an individual customer's load or generation will be limited so that distortion of the system voltage at any point on the PPL EU system due to that customer's equipment will not exceed the values given in Table 1. These limits apply during both normal operation of the system and during outage of any single facility.

**Table 1: PPL Electric Utilities Criteria -
Maximum Allowable Harmonic Voltage Distortion Due to a Single Customer**

Voltage Level	Distortion Factor (% System Voltage)	Individual Harmonic (% System Voltage)
4 kV through 23 kV	3.0	1.7
69 kV through 138 kV	1.5	1.0
230 kV through 500 kV	1.0	0.7

04-29-2010