Demand Basics

To manage electricity, a business must not only know how much is used but also understand a facility's demand. To help, look below for some basic points.

DEFINED

Demand is the measure of the amount of power used to run machinery and equipment at a specific point in time. When more than one piece of equipment is operating at the same time, the total demand is cumulative.

When demand is greater than power available, it places a strain on the utility system.

For most utilities, demand is calculated based on the average load placed within 15 to 30 minutes.

Peak or maximum demand is the point at which demand is at its highest. Utilities may bill for peak demand because it is challenging for them to anticipate and deliver power to everyone's peaks.

MEASUREING DEMAND

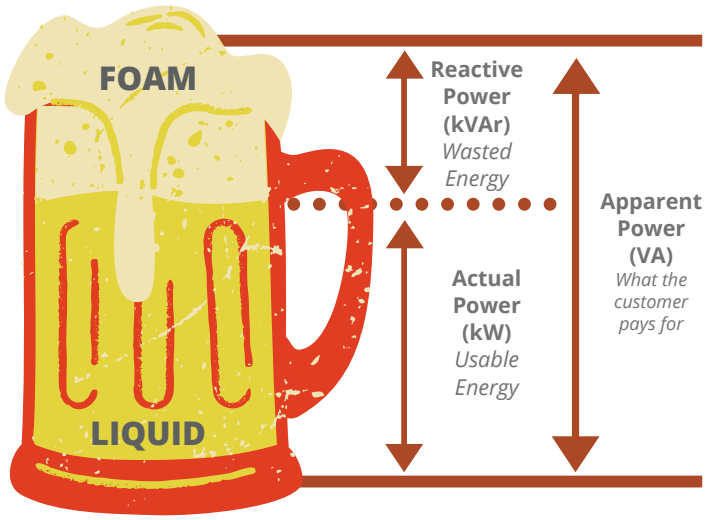
Demand can be recorded in kilowatts (kW) or kilovolt-amperes (kVA). KW is the measurement of *actual power* (i.e. the power necessary to run equipment), while kVA is the measurement of *apparent power* (i.e. the power necessary supplied by the utility based on the facility's power factor).

POWER FACTOR

Power factor (PF) is an expression of energy efficiency and is the ratio of actual power used in a circuit to the apparent power delivered to the circuit.

PF is measured on a scale from 0 to 1 and is often expressed as a percentage. The lower the percentage, the less efficient power usage is (e.g. a 96% PF represents more efficiency than a 75% PF).

A PF equal to 1 (or 100%) would reflect a perfectly efficient system where all apparent power is converted to actual power. Note: no system is completely efficient.



ANALOGY: Imagine a freshly poured beer. The top is foam, while the bottom is liquid. You pay for the whole beer, but drink only the liquid. The liquid is actual power (kW), while the whole beer is apparent power (VA). To convert kW to kVa, you need to know the power factor or efficiency of a system (i.e. the ratio of liquid to beer.)

Explained Another Way

$$\text{POWER FACTOR} = \frac{\text{ACTUAL POWER (KW)}}{\text{APPARENT POWER (VA)}}$$

The efficiency of an electrical system's ability to convert apparent power into actual power is expressed by a power factor.

Poor power factor matters to companies because it can result in:

- Reduction in the amount of available usable power.
- Requires a higher current to supply loads, due to less usable power.
- Higher overall operating cost, due to a higher current requirements.
- Potential surcharges applied to electric bill by the utility.

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