

What is your PQ IQ?

Understanding power quality issues



\$15 billion

Annual cost of power quality issues



80%

Of all power quality problems originate on the customer's side of the meter or originate from within a facility



17 hours

Plants' restart time after shutdown

\$130 thousand

Potential costs of downtime in lost revenue for a facility

3–6%

The amount of manufacturing sales money spent to correct PQ problems

\$14 thousand to \$6.5 millions/hr

Estimated range of downtime costs to mission-critical facilities

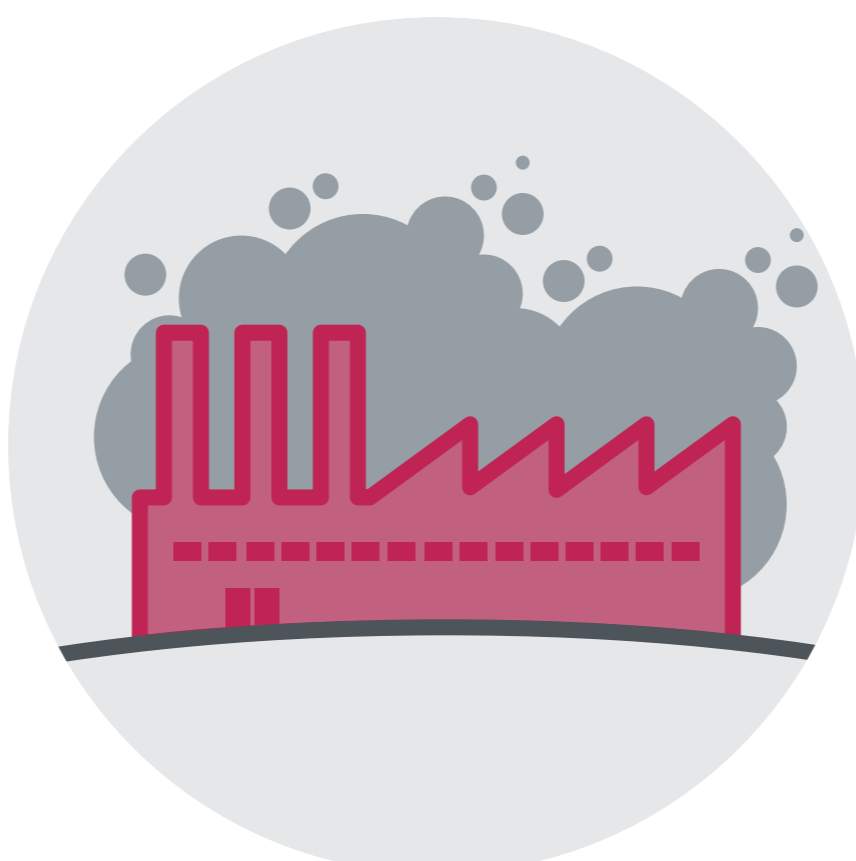
50%

The amount of mission-critical power outages attributable to power quality issues

* Most impacted equipment: electronics, controls and motors

Typical Power Quality Symptoms

- Flickering and blinking lights
- Transformer issues, such as noise, extra hot, or premature failure
- Panels, neutral wiring, and other distribution equipment running hot
- Printed circuit board failures in drives, PLCs, industrial PC, etc.
- Breaker trip and drive shutdown

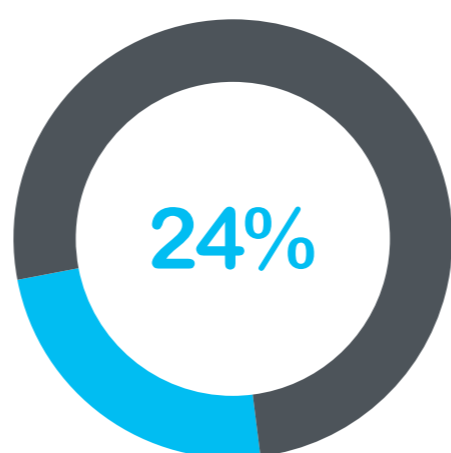


- Premature motor failure and unexpected equipment shutdown
- Contactors dropping out
- Poor network communications
- Higher utility bills
- Poor power factor
- Low system capacity

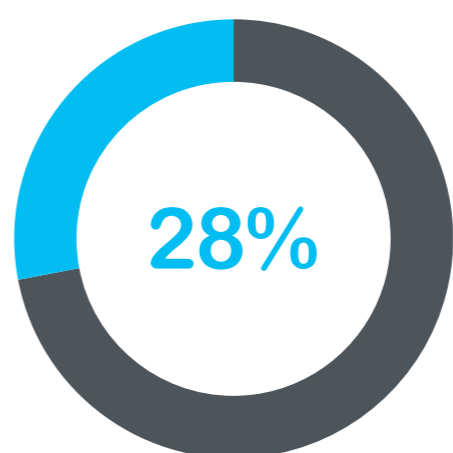
Types of Power Quality Issues

- **RMS voltage variations:** sags, swells, interruptions
- **Voltage transients:** impulsives, oscillatory
- **Waveform distortion:** harmonics, interharmonics, sub-harmonics
- **Voltage imbalance**
- **Voltage fluctuation**
- **Power frequency variation**

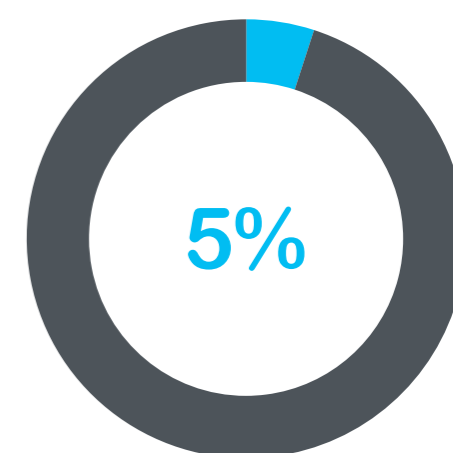
Voltage dips



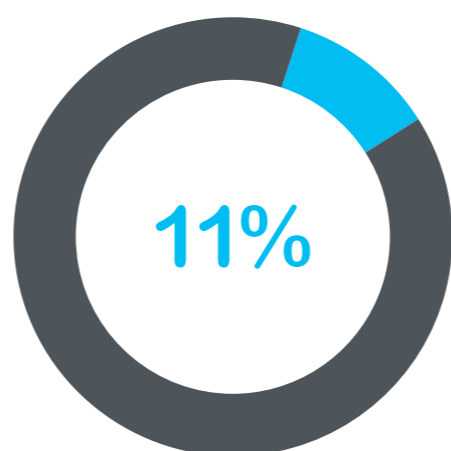
Transients & surges



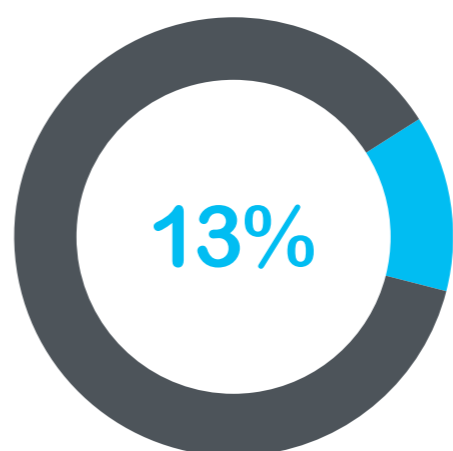
Harmonics



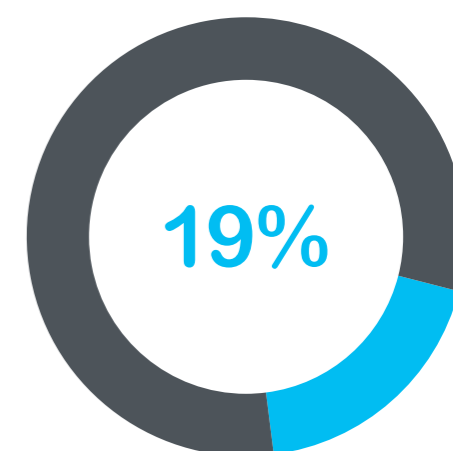
Other PQ problems



Long interruptions



Short interruptions



The benefits of improving power quality

- Improved energy efficiency
- Reduced utility costs
- Reduced waste and improved operations
- Increased productivity
- Minimized downtime
- Increased equipment and power reliability
- Lower operating costs



The negative effects of PQ issues

- Energy losses
- Unplanned downtime
- Premature aging of equipment
- Utility penalty costs
- Decreased productivity
- Service call costs
- Decreased reliability



Ways to improve power quality

- Power factor correction
- Voltage stabilization
- Harmonic filtering
- Power conditioning
- Reactive power compensation

For more information about power quality solutions from Square D™ by Schneider Electric™ Email: powersolutions@schneider-electric.com