



Electrical Service Planning Before the Panel

Service size, generator capacity, and transformer kVA are connected decisions. Start with diversified load, then prove the upstream equipment can support it.

A panel label is not a service calculation. Reliable service planning works from actual connected and diversified load toward the equipment that supplies it.

Worked example from the live calculator

The live service-load calculator totals 34,700 VA, or 145 A at 240 V, for its default dwelling inputs. It selects a 150 A service with about 4% headroom.

Calculate diversified demand first

The service-load engine separates connected load from the demand that is expected to run together. This is the point to account for planned EV charging, heat pumps, and shop loads, not after equipment is purchased.

Size backup for the loads that matter

Generator planning distinguishes running watts from starting demand and makes the critical-load decision explicit. A generator is not automatically sized to the entire service.

Confirm the upstream and protective details

Transformer kVA and motor circuits need their own checks, while grounding is a safety requirement, not a capacity upgrade. Keep utility, code, and fault-current review in the final design.

Key takeaway. Service planning becomes defensible when diversified demand drives the panel, backup, and transformer conversation.

Assumptions

- Final equipment ratings, fault duty, and utility requirements must be confirmed by the responsible electrical professional.

Sources

- NEC Articles 220, 250, 430, verify adopted edition

Frequently asked questions

Can I add breaker ratings to size a service?

No. Breaker handles do not reveal simultaneous demand.

Should a generator run every load?

Not necessarily. Critical-load selection is usually the practical and economic choice.

Is transformer kVA the same as service amperage?

No. Voltage and load characteristics determine the relationship.

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