



## ALL ABOUT LOAD

# SERVICE APPLICATION HOW-TO QUICK GUIDE

---

*New or expanded electrical connections: Getting power **when** and **where** you need it.*

**To expedite your electricity service request**, FortisAlberta has published a collection of Quick Guides designed to help you: **1.** Complete the Service Application by way of answers to Frequently Asked Questions (FAQs) **2.** Authorize your electrician or contractor to act on your behalf **3.** Understand how to calculate electric loads and potentially save money and time.

Legal Disclaimer: Quick Guides provide general information. They are not intended to act as substitutes for advice from your contractor, consultant or electrician, or as a replacement to FortisAlberta's Terms and Conditions (T&Cs).

---

**LOAD: What is it? Will I save money or time? How is it calculated? Where does my electrician or contractor fit in? How do I get help?**

---

### LIST OF QUICK GUIDE REFERENCE DOCUMENTS:

**Third-Party Authorization:** Understand the impact of appointing electricians/consultants to act on your behalf.

**Service Application FAQs:** Find the answers to commonly asked questions when requesting a new service e.g. finding land description details and determining your service type.

**All About Load:** Learn how to save time and money by right-sizing your service.

### COMMERCIAL / GENERAL SERVICE

**OPERATION CLASSIFICATIONS:** Municipal buildings, schools, churches, laundry facilities within a residential apartment complex, multi-unit strip malls and industrial bays, independent businesses such as bakeries and garages, home- or farm-based businesses requiring separate metering such as woodworking or welding shops and any type of farming operation without a residence on site.

# Table of Contents

Electrical Load: What is it ? Why is it important?.....	1
Determining Operating Demand Load in kW is Key to Right-Sizing Your Service .....	2
Impact of a Mis-Sized Load .....	2
Calculating Electrical Load: Inputs and Worksheet.....	3

## Electrical Load: What is it? Why is it Important?

**Definitions:** **Electrical Load** is the **total possible energy consumed** by a system, circuit, component, device or equipment that is connected to a source of electric power. Electrical load is further broken down into Connected Load and Operating Demand Load.

1. **Connected Load** is the energy consumed when all connected systems, circuits, components, devices or equipment are operating and drawing power at the same time.
2. **Operating Demand Load** presents a more realistic total of energy consumed (drawn). It gauges how much energy is used in the optimal operation of your service based on what electrical items are likely to operate simultaneously day-to-day e.g. furnaces and air conditioning units are unlikely to run at the same time so you would not add these two items together when calculating an operating demand load.

**L**oad is one of the most important inputs to determine the size of your transformer—the static device connected to a power line that transfers electrical energy to circuits, components, devices or equipment. And load size is a primary driver of **the up-front and month-to-month costs of your service.**

ICON KEY	
\$	Save money
🕒	Save time
👉	Expedite Service

\$🕒👉 **In some cases, business owners, consultants, electricians, engineers, etc. mistakenly believe that “Bigger is Better.”** However, the best thing customers can do for their business and bottom line is “right-size” their electrical load. In the most general terms, here’s why:

**Typically, the bigger the Operating Demand Load, the bigger the transformer size.**  
**Impact:** Lower upfront construction costs **BUT** larger month-to-month service charges. **Reality:** If you have over-estimated your load, you pay for more power than your business will ever use.

**Typically, the smaller the Operating Demand Load, the smaller the transformer size.** **Impact:** Higher upfront construction costs **BUT** lower month-to-month service charges. **Reality:** Load is rarely under-estimated in the initial design phase. If there isn’t enough electricity to meet demand, it’s usually because of “Load Creep,” which happens when a business owner has expanded services e.g. added a car wash without making a call to FortisAlberta to recalculate load.

\$🕒👉 **In every instance, right-sizing the Operating Demand Load ensures optimal power at the best price in a safe and reliable operating environment.** **Impact:** Monthly bills that more closely reflect what you

## ELECTRICAL LOAD QUICK GUIDE

actually use. **Reality:** It's worth the time to get load calculations right. **NOTE: We have added a worksheet at the end of this GUIDE to help you calculate the unique load requirements of your project.**



### **\$🕒👤 Determining Operating Demand Load in kW is Key to Right-Sizing Your Service**

Using the wrong criteria is one of the most common reasons for mis-sizing load. All utility companies size a service based on Operating Demand Load—the power you are most likely to use in your day-to-day operations. Problems occur when we receive a load calculation based on Connected Load—the power used if every device, circuit, piece of equipment and system were operating at the same time 24/7 along with the extra 15 per cent sometimes added by contractors as a buffer. With the right load information, FortisAlberta will size your service to ensure you get the power you need at a price that aligns with your actual usage.

## Impact of a Mis-Sized Load

**\$🕒👤** If your load is not accurate, you may be entered in the wrong Rate Class category. The impact of misclassification can be significant. For instance, any project with a load more than 75 kilowatts (kW) is classified as a Rate 61. This means, at the very least, our monthly minimum payment will be calculated on two-thirds of your load regardless of whether you used that much power or not for the entirety of your contract.

### **Why you should care about Electrical Load**

**Case Study:** In the Service Application phase, a customer or their designated representative tells us their Operating Demand Load is expected to be 100 kW and we subsequently size the service to meet those requirements. When the customer receives the first electrical bill, it becomes clear that the business has only used 40 kW—a fraction of contracted use. Also evident is a request for payment on two-thirds of the 100 kW initially contracted and not on the 40 kW of actual use ( $100 \text{ kW} \times 2 / 3 = 66 \text{ kW}$ ).

### **\$🕒👤 I want to expand my business at some point. Can I get a bigger service to accommodate that change?**

There have been occasions when our customers have accurately calculated load but want larger services to accommodate possible expansion plans. As a regulated utility, we are required to right-size a service to current use—12 months beyond the onset of service.

- If you require a bigger service at any time, FortisAlberta will upgrade the service, invest in the incremental load difference and adjust your contract accordingly.

### **\$🕒👤 On the advice of my electrician, I want to upsize my transformer. What are my alternatives?**

- If you want a larger than required service at time of construction, we will meet that demand but will charge an Optional Facilities fee—the incremental difference between the customer-driven enhancement and FortisAlberta's standard requirements.
- If your demand for a larger transformer is justified, we will right-size your service.

### **\$🕒👤 How do I know if my contracted load is bigger than I need and what can I do to fix it?**

- First: It's important to review your monthly bill for discrepancies. Your bill will display available/contracted power (Operating Demand Load) and the power you have drawn during the billing period to run your business. If you think a review is warranted, please phone FortisAlberta at 310- WIRE (9473) and ask for a reassessment of the original estimate. From there, we will perform a re-calculation, and if appropriate,

downgrade the service to reflect your actual usage. There could be costs associated with swapping out your transformer, so it's important to take the time upfront to accurately calculate your Operating Demand Load.

### **\$🔌 What happens if I under-sized my load?**

- If your service needs to be upgraded as an emergency call because of “Load Creep” e.g. expanded services without phoning FortisAlberta to discuss new power requirements, you may be invoiced for replacement costs.
- In a non-emergency situation, you are advised to phone FortisAlberta at 310-WIRE (9473) to prompt a review of the original estimate, perform a re-calculation, and if appropriate, upgrade the transformer to meet actual usage.

**NOTE:** If a customer underestimates the Operating Demand Load, FortisAlberta may invest in the incremental difference between contracted and required Load depending on circumstances. Please phone 310-WIRE (9473) to discuss.

### **\$🔌 I own three separate businesses: a hair salon, a Sales Centre for new homes that we move geographically across the province and a warehouse with nominal power needs the first two years, and significantly more power required in third-year expansion plans. Are they all treated equally?**

- FortisAlberta would classify the hair salon as a permanent service. Like all Commercial/General Services, Operating Demand Load is required to **right-size the transformer** so as to close the gap between power actually used and power initially estimated.
- The Sales Centre is categorized as a temporary service. Utility construction costs and effort are similar to a permanent operation, but the business continuity at a specific address is limited. For this business type, the customer incurs the full cost of construction plus salvage fees e.g. the cost to build and remove.
- The warehouse would be quoted as a staged permanent service, with electrical Operating Demand Load requirements collected and assessed at a lower rate for the first two years, and another higher rate more than two years later to reflect the increased demand.

## **Calculating Electrical Load: Inputs and Misconceptions**

**INPUT: Panel Size**    \$🔌 Your electrician should complete a preliminary load calculation as a prelude to determining your Operating Demand Load. We will help you calculate your Operating Demand in kW if your electrician can confirm what percentage of your panel size will be loaded at any one time on a day-to-day basis.

**Remember:** the idea is not to determine total capacity—the power required to run every connected system, device, circuit, piece of equipment simultaneously (Connected Load). Rather, the intention is to estimate actual use—the power necessary to optimally run your business at any given time (Operating Demand Load). For instance, if you own a mechanical shop with six bays, it's unlikely that the hydraulic lifts for all bays are operating at exactly the same time as all available power tools and trouble lights.

**MISCONCEPTION: Building Footage**    \$🔌 Calculating Operating Demand Load based exclusively on square footage will likely result in overestimating load requirements. For instance: if you have a 10,000 square-foot building that is being used as a storage facility, it will not use the same amount of energy as a 10,000 square-foot building used for manufacturing.

**INPUT:**

**Calculations AMPs to kW**

Single-Phase Example: 200Amp with a secondary voltage of 120/240V operating at 60%  
Equation:  $200 \times .60 \times 240V / 1000 = 24.96 \text{ kW}$

Three-Phase Example: 200Amps with a secondary voltage of 347/600V operating at 60%  
Equation:  $200 \times .60 \times 600V \times 1.73 / 1000 = 124.56 \text{ kW}$

## Worksheet: Calculating Operating Demand Load

Use the Worksheet as a guide to the inputs and calculations necessary to determining Operating Demand Load—a required field in the Service Application for Commercial / General Service. By taking the time to calculate your power requirements, you will expedite installation of your electrical services and ensure you pay for only the power you use. It becomes even easier if you have a similar service to reference as a comparison.

LOAD INPUTS	INFO REQUIRED		AMPERAGE	NOTES
Electric Panel Size	Size (amps)			Enter the <u>actual</u> panel size: not the service-rated size  NOTE: Multi-site developments e.g. strip malls, need to calculate load as independent bays / units
Secondary/Panel Voltage	3-Phase 4-Wire? Yes <input type="checkbox"/>	1-Phase 3-Wire? Yes <input type="checkbox"/>		
<b>ELECTRIC MOTORS</b>				
Motors  e.g. electric pumps and engines	Number of motors			Take an inventory of every motor that will be in operation at one time or another
For transformer size calculations 1 HP = 1 kVA	Total HP of all motors			Add the HP values of each motor. HP values are found on the Motor Nameplate
	Largest HP of all motors			Identify the largest possible HP requirement

**ALL OTHER ELECTRICAL COMPONENTS: SEE FOLLOWING LIST OF POSSIBILITIES**

CATEGORIES	SPECIFICS	NUMBER OF UNITS	kW PER UNIT	TOTAL kWs	NOTES
<b>Equipment:</b> e.g. fryers, compressors, freezers, ovens etc.	Compressors				1. Itemize equipment inventory 2. Record the number of units per each equipment type 3. Calculate the total kWs of each equipment type
	Hydraulic lifts				
	Tanning Beds				
Lights	<b>Ceiling lighting in building including parking garage</b>				
<b>Electronic Devices:</b> e.g. printers, computers, exterior signage	The more complete your overall list, the easiest it is to right-size your service. But, low-draw devices can be bundled for a kW estimate.				
Energized parking outlets	Energized parking outlets can distort Operating Demand Load. To increase load accuracy, determine the total number of outlets will be cycling at one time.				
Common Room Amenities: e.g. washers / dryers	For condo buildings, consider common areas such as hallways, elevators, laundry areas and kitchen facilities in addition to per / unit electrical consumption. Likewise, for strip malls, calculate Connected and Operating Demand Loads on a per bay / unit basis.				
Heating & Air Conditioning Units	Heating / cooling units are big-draw items. Take the time to ensure your calculations are accurate.				
Connected Load	Value in kW if all connected systems, circuits, components, devices or equipment were operating and drawing power at the same time.			Value in kW	
Operating Demand Load Important first steps:	<b>Calculating Operating Demand Load (convert amps to kW where applicable)</b> 1. Determine what electrical items are likely to operate simultaneously day-to-day. Tally their total kW worksheet values OR 2. Add all worksheet kW values and apply a percentage value to represent what, of the total connected load, you'll likely need to optimally run your business. Typically, that percentage ranges from 50 to 75 per cent of Connected Load. Your Quoting Analyst will review your inputs to refine your calculations.			1.Total kW of equipment likely to operate simultaneously day-to-day OR 2.Value in kW of Connected Load x percentage factor = Operating Demand Load	