



SUBJECT

**Standard Voltage**

**Customer Requested Service**

Typically obtained from the customer plans. When FPL is to provide a voltage or service other than that shown on the plans or requested by the customer, it is extremely important that all interested parties (engineer, electrical contractor, etc.) be notified, **in writing**, of the change to avoid potential and costly misunderstanding. Typical service voltages include:

**Single Phase**

**Three Phase**

120 Volt

120/240 Volt

240/480 Volt

120/208 Volt (Three phase source)

277/480 Volt (Three phase source)

120/240 Volt Open Delta

120/208 Volt Wye

277/480 Volt Wye

Refer to **SPO 21010.3** for information regarding **standard** voltages, **SPO 21010.4** regarding FPL designated points of delivery, and **SPO 21450** regarding customer contributions.

**Underground Service**

CIAC applies when a voltage other than the standard voltage for the load served is being requested (**SPO 21010.3**).

Transformers and handholes have cable (size and number) limitations. Consider when first reviewing customer plans so changes can be negotiated, if necessary.

- Single phase padmounted transformer installations are limited to 167 KVA. Regular style transformers are recommended for most non-residential applications.
- Three phase 120/208V padmounted transformer installations are limited to 1000 KVA (radial and loop).
- Three phase 277/480V padmounted transformer installations are limited to 2500 KVA (radial) and 1000 KVA (loop).
- Three phase 120/240V closed delta service is not available from padmounted transformers.
- CIAC (differential cost) is required for vault service when a padmounted transformer installation would have been, at FPL's preference, been provided. Vaults should only be used where padmounted transformers cannot.

Exercise caution when considering installation of maximum size (KVA) padmounted transformers. If load is added, they cannot be replaced with those of larger capacity.



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**Scope**

Explanation of standard service voltages (excluding street lighting).

**General**

Standard service voltages are generally a function of customer load.

FPL's standard practice is to provide a single voltage to a customer. If, however, the local inspecting authority approves the installation, all Electrical and Safety codes are adhered to, and the customer pays the additional costs, FPL may agree to provide a second voltage.

The following are guidelines for FPL's standard voltages.

**120/240 Volt - 1 PH**

Many appliances and small electrical apparatus are manufactured for single phase power. FPL's standard voltage for residences and many small business is 120/240V 1PH. Single phase service is limited to a maximum of 167 KVA (unless a vault is provided) due to transformer sizes, therefore take into consideration the growth potential of the customer, especially when used for business applications. FPL's standard voltage for motors less than seven and one-half (7 ½) horsepower is single phase.

**240/480 Volt - 1 PH**

Typically used for street lighting or similar uses. Rarely requested.

**120/240 Volt - 3 PH  
 Open Delta**

Standard when customers have concurrent large single phase and small three phase loads in one service, for example a condominium building consisting of single phase residential units and a 3 phase elevator. As with single phase, this arrangement's growth capability is limited, as is its ability to deliver adequate power to start large motors.

Three phase service is provided where it is typically required to serve the load or where, in the opinion of FPL, the use of single phase is impractical. Motors of seven and one-half (7 ½) horsepower and larger are not generally available in single phase; therefore, our standard service for these motors is typically three phase.

**Note:** When requested to provide three phase service where single phase is typically provided, the customer is required to pay the total differential cost between three phase and single phase as a contribution in aid of construction (CIAC).

When motor sizes exceed 20 hp or the 3PH load exceeds 75 KVA, or if the total load exceeds 150 KVA, open delta oftentimes cannot be used. Consult with Engineering if these conditions exist.



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**120/240 Volt - 3 PH Closed Delta** This type of installation is only provided for a new customer under very special circumstances (the customer's equipment is **ONLY** available in 120/240V, the load exceeds the capacity of open delta, **AND** the area planning engineer approves the installation). The addition of the third transformer to an open delta arrangement makes it a closed delta, and this is done usually to increase the capacity of the transformer bank or to increase the ability to start large motors. The addition of the third transformer to an open delta bank usually occurs when an established customer increases motor sizes or power requirements. Closed delta banks are usually limited to a maximum demand of 300 KVA.

**120/208 Volt - 3 PH Wye** This arrangement is preferred for balanced loads from 150 KVA to 1000 KVA where there is a combination of single and 3 phase loads. The customer must provide balance in the single phase load for this type service. Normal 120 Volt appliances will perform well on this type of circuit but we should be careful to advise the customer to check his equipment for proper operation on 208 Volts.

**277/480 Volt - 3 PH Wye** This arrangement is preferred for large 3 phase loads from 150 KVA to 3000 KVA or more. This voltage and the equipment associated with it is usually essential for starting large motors and for delivering large amounts of power.

**Customer Contributions** Generally, a Contribution In Aid of Construction (CIAC) is required when any voltage other than the standard voltage is requested and subsequently provided (**SPO 21454**).

<b>SPO 21455 Customer Load<sup>(1)</sup></b>	<b>"Usual and Customary"<sup>(2) (5) (6)</sup></b>
<b>Single phase customer requiring a transformer sized 100 KVA or less</b>	<b>Pole</b> mounted transformer, with OH service
<b>Single phase customer requiring a transformer sized larger than 100 KVA</b>	<b>UG Radial</b> to pad mounted TX or vault <sup>(4)</sup> (167 KVA TX can be installed OH if mutually agreeable & no future load will occur)
<b>Three phase customer requiring TX(s) sized 300 KVA (total) or less<sup>(3)</sup></b>	<b>Pole</b> mounted transformers, with OH service
<b>Three phase customer requiring TX(s) sized larger than 300 KVA (total)<sup>(3)</sup></b>	<b>UG Radial</b> to pad mounted transformer or vault <sup>(4)</sup>

**Table Footnotes:**

- (1) FPL determines the size of the TX, based on estimated **demand** load.
- (2) To FPL's designated point of delivery, at FPL's standard voltage for the application being served (**SPO 21010.3**). Customer pays incremental cost for non-standard voltage or service beyond the FPL designated point of delivery.
- (3) For Open Delta, the threshold is the size of the lighting TX (100 KVA). Closed Delta cannot be served with padmount (consider vault or "wye" if open delta not possible).
- (4) If a padmounted TX can accommodate the load, **and** is preferred by FPL, the padmount is considered "usual & customary" service. If a vault is provided instead of a "usual & customary" padmount, the additional cost of the vault is paid by the customer.
- (5) CIAC<sub>OH</sub> may still apply (**SPO 21454**).
- (6) If "usual and customary" service is a radial and loop service is provided, the additional costs of providing loop service will be paid by the customer. Customers with 500 KVA or greater new or additional demand load will receive a credit of one year's EAR towards the cost of loop service.



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Use this flowchart to help determine whether a customer's load warrants the voltage requested.

