Planning Kitchen Area Wiring

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In most homes, the kitchen draws the greatest electrical load. The size of the main electrical wires serving the home is determined primarily by the often adjacent kitchen and laundry area electrical load. The exception is the electrically heated home where entrance demand is determined both by heating and kitchen-laundry demands.

There are four types of electrical branch circuits in the kitchen, dining room, and laundry areas. These are:

- Small appliance circuits for convenience outlets.
- Laundry circuits for convenience outlets serving washer and small ironers.
- Fixed appliance circuits for range, water heater, dishwasher, disposal, clothes dryer, counter surface cooking units, and separate ovens.
- Lighting and general use circuits for convenience outlets.

The electrical wiring suggestions in this publication generally are greater than the minimum requirements set forth by the National Electrical Code. Electrical codes contain only the minimum provisions considered necessary for safety. Compliance to codes and proper maintenance will result in wiring installations that are free from hazards, but not necessarily efficient, convenient, or adequate for good service or future electrical use expansion.

It is recommended that the minimum size electrical wire used on any 15-ampere or 20-ampere circuit be No. 12 (AWG), and that all wires serving convenience outlets and lighting circuits have copper conductors. Comparative wire sizes with copper or aluminum electrical conductors are illustrated.

An actual 6 ft. 6 in. measurement of electrical wires in American Wire Gauge numbers.

The smaller the wire size number, the larger the diameter of the wire.

Install all room outlets so that no point along a wall-floor line is more than 6 feet from an outlet, including any wall space 2 feet or more in width. The wall space afforded by fixed room dividers, such as free-standing bar-type counters, is included in the 6-foot measurement.

Small appliance circuits

Small appliance circuits are 20-ampere, 120 volt branch circuits to be used for all convenience outlets in the kitchen, pantry, breakfast room, dining room, and family room. Each outlet should have two or more 20-ampere small appliance circuits in each of these rooms. In the kitchen, outlets along the counter area should be fed from at least two separate 20-ampere circuits. If good practice to have every other outlet along the counter space fed by a different circuit. Have no more than six outlets per small appliance circuit. In the kitchen and in the room area, a receptacle outlet should be installed at each counter space wider than 12 inches and the outlet for each 4 linear feet of work counter.

When remodeling or building a new home, great care should be taken in locating switches and outlets above counter tops. Height of ceramic tile or splash panels on finished counter tops dictates proper location of outlets and switches. Generally, the outlet height is 44 inches above the floor line or 6 to 8 inches above the counter top.

Kitchen space for each upright freezer, refrigerator-freezer, or refrigerator should allow a wall space of at least 33 inches measured along the floor and 68 inches in height. The electrical outlet height for these appliances is normally 44 inches above the floor.

A separate circuit for a refrigerator-freezer or freezer is suggested for several reasons: The frostless refrigerators and freezers may have a heavy demand for electrical current during starting. Should other appliances be operating on the same line, the circuit breaker could open due to excessive amperage and interrupt power to the refrigeration unit. Because of the high wattage demand of large freezers and refrigerator-freezers, these appliances will operate more efficiently on a separate 20-ampere circuit, which has less power loss in wiring.

Laundry circuit

The laundry area needs at least one 20-ampere, 120 volt branch circuit for the washer and portable ironing devices. Locate the washer electrical outlet in a wall area that provides adequate space for the washing machine—30 inches minimum. The height of the electrical outlet for the washer is normally 44 inches above the floor.
above the floor line. For greater convenience, however, if it is undesirable to have the outlet showing above the washer, place the outlet 12 to 28 inches above the floor.

**Fixed appliance circuits**

The dishwasher, freezer, refrigerator-freezer, broiler-toaster oven, and waste disposer should each have separate circuits. The disposer and compactor may be placed on the same circuit.

**Recommended wire sizes, circuit breakers, and receptacles for various fixed appliance circuits are listed in the accompanying table.**

**Electrical Wiring Suggestions for Household Appliances on Individual Circuits**

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Circuit voltage</th>
<th>Outlet rating</th>
<th>Number of wires</th>
<th>Wire (AWG)</th>
<th>Overload protection breaker size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothes dryer</td>
<td>120/240</td>
<td>50</td>
<td>3</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Range</td>
<td>120/240</td>
<td>50</td>
<td>3</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Built-in oven (single unit)</td>
<td>120/240</td>
<td>30</td>
<td>3</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Built-in ovens (double unit)</td>
<td>120/240</td>
<td>50</td>
<td>3</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Counter-top unit (cooking surface)</td>
<td>120/240</td>
<td>50</td>
<td>-</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Electric water heater</td>
<td>240</td>
<td>30</td>
<td>-</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>120</td>
<td>20</td>
<td>-</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Waste disposer</td>
<td>120</td>
<td>20</td>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Refrigerator-freezer</td>
<td>120</td>
<td>20</td>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Food freezer</td>
<td>120</td>
<td>20</td>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Washer</td>
<td>120</td>
<td>20</td>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Toaster oven</td>
<td>120</td>
<td>20</td>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

1. All fixed and portable appliances must be grounded by use of a grounding-type receptacle, except ranges, clothes dryers, built-in counter cooking units, and built-in oven units.
2. Includes a grounding wire.

**Lighting and general use circuits**

Branch circuits for lighting and general use must not serve outlets intended for small appliances, laundry, or fixed appliance. This means that most convenience outlets, except a clock outlet located in the kitchen, laundry, kitchen, pantry, breakfast room, and dining room must not be on lighting and general use circuits. Stemmed lighting fixtures, and other 120-volt outlets located within cabinets or cupboards, or 5 1/2 feet or more above the floor can be placed on lighting and general use circuits. Do not use more than 10 general-purpose convenience or lighting outlets per circuit.

**Grounding requirements**

All receptacles used for refrigerators, freezers, air conditioners, washers, compactors, dishwashers, disposers, and all outlets usable with portable, hand-held motorized equipment must be of a grounding type. Frames of electrical ranges, wall-mounted ovens, counter-mounted cooking units, and clothes dryers can be grounded to the neutral conductor of the circuit if the neutral wire size is Number 10 (AWG) or larger. All other fixed appliances must be grounded by a grounding conductor.

Convenience outlets, whether for general use, small appliance, or laundry outlet circuits must be grounding type, identified by three-pronged plug.

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