

Don't Get Shocked, It's Electric (The Basics)

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In this session, you will learn that the simplicity of how an electric fireplace works is a vital need for the future of all specialty Hearth professionals. This is a basic technical introduction to electric fireplaces that will give you a broad understanding and take the fear out of this fast-growing category.

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PRO TIPS

- The National Electric Code (NEC) determines that the load on a circuit breaker be no more than 80% of the rating for the breaker for continuous loads and no greater than 100% for intermittent loads.
- Calculate Amps: $\text{Current(Amps)} = \text{Power(Watts)} / \text{Voltage(Volts)}$ *OHMs Law*
- Calculate power for breaker size: $\text{Minimum Breaker size} = \text{Current(Amps)} \times 1.25$

Example:

The 120V fireplace uses 1500 watts of continuous power when the heater is on high heat.

Current (Amps) = Power (Watts) / Voltage (Volts) 1500Watts / 120Volts = 12.5Amps

12.5Amps x 1.25 = 15.625Amps. The minimum breaker must be higher than 15 amps with a 20% margin, therefore the recommended circuit breaker for the fireplace is a 20 amp breaker. The 20Amp breaker with this fireplace has ~4amps to spare.

PRO TIPS

PRO TIP: Calculate the fireplace BTUs by referencing the heater's total wattage and multiplying by 3.41.

1 Watt Hour = 3.41 BTUs

Example: Watts x 3.41 = BTU/H

- A fireplace with a 1,466-Watt heater = $1466 \times 3.41 = \sim 5,000$ BTU per hour
- A fireplace with a 2,932-Watt heater = $2,932 \times 3.41 = \sim 10,000$ BTU per hour

A 5,000 BTU fireplace can warm up a room of roughly 400-500 square feet.

A 10,000 BTU fireplace can warm up a room of roughly 800-1000 square feet.

Power requirements

- 1500 Watt or 5000 BTU Fireplaces
 - Recommended a dedicated 20amp 120VAC connection.
- 3000 Watt or 10,00 BTU Fireplaces
 - Dedicated 15amp 208~240VAC connection. (Double pole breaker)
 - Most electric fireplaces that require 240 will also need a **neutral** connection, not just two hot lines and one ground connection.
- No Heat fireplaces
 - Standard 15Amp120VAC connection

Required tools:

*MOST SCREW DRIVERS SETS WILL HAVE ALL NECESSARY SCREW DRIVERS

**STANDARD/FLAT/SLOTTED SCREW DRIVERS NOT COMMONLY USED OR NEEDED FOR SERVICE

***WIRE STRIPPERS ARE AVAILABLE WITH CRIMPER, CUTTER, AND STRIPPER IN ONE TOOL

- #0 x 2-1/2" PHILLIPS SCREW DRIVER (MAGNETIC PREFERRED) (QTY-1) *
- #1 x 2-1/2" PHILLIPS SCREW DRIVER (MAGNETIC PREFERRED) (QTY-1) *
- #2 x 1-1/2" PHILLIPS SCREW DRIVER (SHORT/STUBBY) (MAGNETIC PREFERRED) (QTY-1-2) *
- #2 x 4"-6" PHILLIPS SCREW DRIVER (MAGNETIC PREFERRED) (QTY-1-2) *
- NEEDLE/LONG NOSE PLIERS(QTY-1-2)
- WIRE/DIAGONAL CUTTING PLIERS *** (QTY-1)
- DIGITAL MULTIMETER (**MINIMUM TESTING: VDC, VAC, CONTINUITY**) (QTY-1)
- **(A NON-CONTACT VOLTAGE TESTER DOES NOT TAKE PLACE OF A MULTIMETER)**
- WIRE STRIPPERS *** (QTY-1)
- CRIMPER *** (QTY-1)
- STANDARD/FLAT/SLOTTED SCREW DRIVER(OPTIONAL) (QTY-1-2) **
- UTILITY KNIFE/KNIFE (QTY-1)

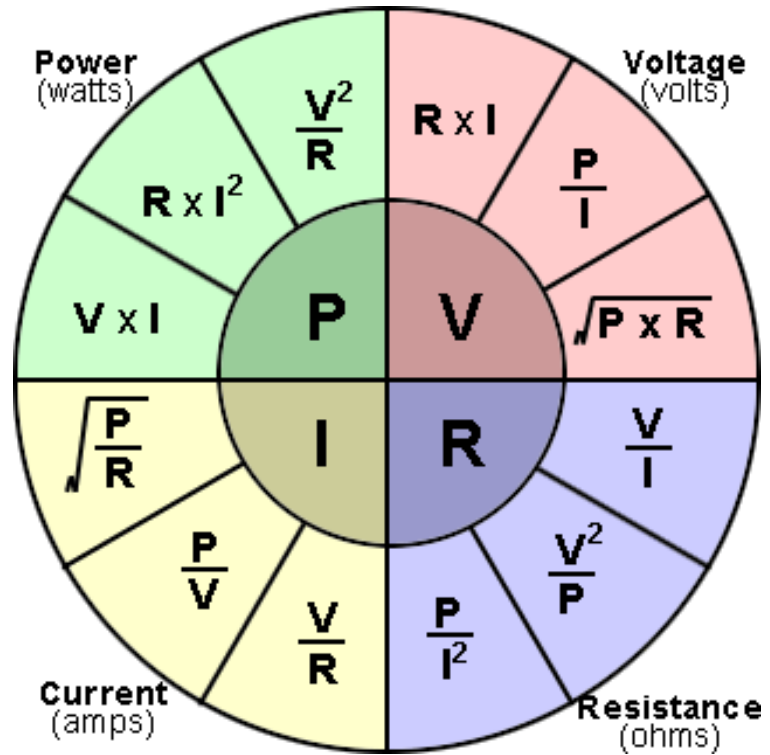
Optional/Recommended tools:


- SUCTION CUPS (RECOMMENDED) (QTY-1-2)
- GLOVES (RECOMMENDED) (QTY 1 PAIR)
- MICRO FIBER CLOTHS (QTY-3-4)
- MAGNETIC PICKUP TOOL (RECOMMENDED) (QTY-1)
- HEADLAMP (RECOMMENDED) (QTY-1)
- FLASHLIGHT (QTY-1)
- 1/4" DRIVE SPINNER HANDLE/SOCKET DRIVER (QTY-1)
- 5.5mm OR 7/32", 1/4" DRIVE DEEP SOCKET(small socket set) (QTY-1)
- FLUSH CUTTING PLIERS FOR ZIP-TIES (QTY-1)
- PICK SET (QTY-1)
- DROP CLOTH (QTY-1)
- BUCKET (QTY-1)
- SMALL SHOP VACUUM OR BUCKET VACUUM (QTY-1)
- SOLDERING IRON PEN (WITH SOLDER AND FLUX) (QTY-1)

Other supplies:

- MILD GLASS CLEANER(QTY-1)
- WATER & SOAP SOLUTION (RECOMMENDED) (QTY-1)
- LITHIUM GREASE (RECOMMENDED) (QTY-1 TUBE)
- ELECTRICAL TAPE (QTY-1)
- ZIP-TIES (SMALL TO MEDIUM SIZE)
- INSULATED MALE/FEMALE SPADE TERMINALS (SMALL KIT)
- DOUBLE SIDED TAPE
- PEN & PAPER

COMMON ELECTRIC FIREPLACE SYMBOLS



COLOR	SYMBOL	DESCRIPTION:	VOLTAGE
●	L	= VAC LINE IN/HOT LINE	120VAC
●	L1	= VAC PRIMARY LINE IN/HOT	120VAC
●	L2	= VAC SECONDARY LINE/HOT	120VAC
○	N	= VAC NEUTRAL LINE	0VAC
●	G	= VAC GROUND/EARTH	0VAC
●		= VAC GROUND/EARTH	0VAC
○	COM	= VAC COMMON NEUTRAL CONNECTION	0VAC
●	+	= VDC POSITIVE	5-24VDC
●	-	= VDC NEGATIVE	5-24VDC

NOTE VAC RATING IS BASED ON ONE LEAD ON GROUND AND SECOND LEAD ON ANY OF THE OTHER VAC CONNECTIONS.

*** WHEN LEAD IS ON LINE AND SECOND LEAD ON SECONDARY LINE POWER WILL READ 208-240VAC IN NORTH AMERICA***

***DC VOLTAGE BASED ON DIFFERENT COMPONENTS INSIDE FIREPLACE**

What Is going on with my electric fireplace?

- Power Problems

- Q: My fireplace does not turn ON and it doesn't show that it has any power

- A:

- Breaker has tripped(Should be on dedicated circuit especially when running heater)

- Thermal snap disc tripped and needs to reset (if applicable)

- Turned off the main switch or wall switch(if applicable)

- Disconnected, damaged, or loose power cord/terminal connection

- Internal component loose/damaged/failed/defective(Power supply, thermal snap disc/fuse, switch, wire, controls board, main PCBA,)

- Q: My fireplace turns ON and shows power but shuts off immediately flickers, or doesn't do anything

- A:

- Loose connection

- Needs to be reset

- Damaged or loose power cord/terminal connection

- Internal component loose/damaged/failed/defective(Power supply, switch, wire, touch control)

What Is going on with my electric fireplace?

- Response problems
 - Q: My fireplace capacitive touch controls do not respond to my touch
 - A:
 - Not pressing firmly with flat part of finger on function icon.
 - Lost calibration reset assembled fireplace for 60 seconds to recalibrate.
 - Damaged or defective touch control or touch control wire
 - Q: My fireplace manual controls do not respond to my touch
 - A:
 - Loose connection
 - Needs to be reset
 - Damaged or defective touch control or touch control wire
 - Defective main PCBA

What Is going on with my electric fireplace?

- Response problems, continued.
 - Q: My fireplace does not respond to the hand held remote
 - A:
 - Not pressing firmly with flat part of finger on function icon
 - For IR remotes not aiming remote correctly at fireplace
 - For RF lost pairing, re-pair remote to fireplace
 - Batteries drained and need replaced
 - Damaged or defective remote
 - If IR obstructed, damaged or defective IR sensor
 - If RF damaged or defective PCBA

What Is going on with my electric fireplace?

- Sound problems

- Q: My fireplace is making high pitch, humming or squeaking noise when operating with NO HEAT

- A:

- Spindle rod may need grease at rod supports
 - Spindle rod fell off rod supports or is contacting metal when operating.
 - Defective Motor

- Q: My fireplace makes a grinding noise when operating with NO HEAT

- A:

- Spindle rod may need grease at rod supports
 - Spindle rod fell off rod supports or is contacting metal when operating.
 - Something wrapped on spindle rod and binding motor
 - Failed or defective Motor

What Is going on with my electric fireplace?

- Sound problems, continued

- Q: My fireplace is making high pitch, humming or squeaking noise when operating HEAT

- A:

- Loose heater fan assembly or component near assembly
 - Object making contact with fan/blower
 - Damaged or Defective Fan/Blower

- Q: My fireplace makes a grinding noise when operating HEAT

- A:

- Loose heater fan assembly or component near assembly
 - Object making contact with fan/blower
 - Damaged or Defective Fan/Blower

What Is going on with my electric fireplace?

- Heat problems

- Q: My fireplace heat is ON but turns only blows hot temporarily

- A:

- Snap disc tripped, reset unit for 5 minutes and inspect for airflow obstructions.(Intake and/or Exhaust)
 - Thermostat set to low(If applicable)
 - Defective snap disc, replace heating element
 - Damaged or Defective main PCBA

Note: Damage to heating element, snap disc and PCBA can result from not being on dedicated circuit.

- Q: My fireplace heat is ON but turns only blows cold air

- A:

- Snap disc tripped, reset unit for 5 minutes and inspect for airflow obstructions.(Intake and/or Exhaust)
 - Thermostat set to low(If applicable)
 - If applicable thermal fuse has blown, replace heating element
 - Damaged or Defective main PCBA

What Is going on with my electric fireplace?

- Image problems
 - Q: My fireplace is ON but no flames appear or partial flames
 - A:
 - Anti-reflective material fell or other obstruction inside
 - Spindle rod off support
 - Lights not aimed correctly at spindle rod or fell of mounts
 - Lights damaged or defective
 - Q: My fireplace is ON but flames frozen or stutter
 - A:
 - Spindle rod off support or disconnected from motor
 - Something binding spindle rod
 - Damaged or defective motor