



## Equipment Power Requirements and Connections

**All building electrical power and wiring shall comply with the currently adopted National Electrical Code (NEC) and the Uniform Building Code (UBC).**

**WARNING: Failure to follow these specifications can cause damage to your product and can void the warranty.**

- Do not modify the plug provided with this product. If the plug will not fit your electrical outlet, have a proper outlet installed by a qualified electrician.
- All power outlets must be functional the day of delivery / assembly of the product. The client is responsible for any additional installation charges associated with return visits.
- Electrical supply may fluctuate in your area. To ensure stable performance of the product, we require the following wiring gauges based on the distance between the unit and the panel: 100 ft. or less = 12-gauge wire; 101 ft. – 125 ft. = 10-gauge wire, 126 ft. – 150 ft. = 8-gauge wire must be used. A run over 150 ft. is not recommended.
- Brigadoon Fitness recommends circuit breakers designed to handle inductive loads. An example is the QO-HM120 breaker.
- Wiring insulation: Comply with NEMA WC70 for Types THHN, THWN, THWN2, XHHW.

### Brigadoon Fitness Treadmills

- All Brigadoon Fitness treadmills require a dedicated 120V/20A circuit with a non-looped (isolated) ground. □ A dedicated circuit means that each outlet you plug into should not have anything else running on that same circuit. □ Each treadmill must have its own circuit breaker with dedicated neutral and ground terminated at the panel.
- Please refer to NEC Article 210-21 and 210-23 for additional information.
- The treadmill receptacle must be a NEMA 5-20R receptacle.
- The power cord on the treadmills use a NEMA 5-20P plug.

### Non-Treadmill Cardio

- All non-treadmill cardio equipment use a NEMA 5-15P plug.
- The equipment requires a 120V/15A circuit. Multiple units may be daisy-chained together, up to four units per 15A circuit. The non-treadmill cardio receptacle must use a NEMA 5-15R receptacle, or a NEMA 5-20R T-Slot receptacle. These circuits must not be connected with other motor driven appliances or lighting fixtures. The equipment requires a dedicated 120V/15A circuit. We recommend one (1) electrical wall outlet per machine. (Daisy-chaining of up to four (4) 7000E non-treadmill products of up to four (4) units per 15A circuit is possible but not recommended.

### Self-Powered

- Bikes and Ellipticals may be self-powered depending on the console type. □ Units using self-power require a minimum RPM to power the console and do not require supplemental power.

## Facility Power Information

Product	Line Voltage (V)	Line Frequency (Hz)	Current (RMS Amp)	Circuit Configuration	Outlet	Max Power Dissipation (Watts)
CIR-TM8000E-C (touchscreen)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-TM8000-C (LED)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-TM7000E-C (touchscreen)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-TM7000-C (LED)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-TM6000IE3-C (LED)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-TM6000AC-C (LED)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
CIR-EL7000E-C (touchscreen)	120	50-60Hz	15**	Shared **	NEMA 5-15**	385
CIR-EL7000-C (LED)*	NA	NA	NA	NA	NA	NA
CIR-EL6000-C (LED)*	NA	NA	NA	NA	NA	NA
CIR-RB7000E-C (touchscreen)	120	50-60Hz	15**	Shared **	NEMA 5-15**	385
CIR-RB7000-C (LED)*	NA	NA	NA	NA	NA	NA
CIR-RB6000-C (LED)*	NA	NA	NA	NA	NA	NA
CIR-UB7000E-C (touchscreen)	120	50-60Hz	15**	Shared **	NEMA 5-15**	385
CIR-UB7000-C (LED)*	NA	NA	NA	NA	NA	NA
CIR-UB6000-C (LED)*	NA	NA	NA	NA	NA	NA
BRI-TM6500-D-Silver (LED)	120	50-60Hz	20	Dedicated	NEMA 5-20	1650
BRI-VMT7500-S (LED)*	NA	NA	NA	NA	NA	NA
BRI-SE7500-S (LED)*	NA	NA	NA	NA	NA	NA
BRI-RW7500-D1 (LCD)*	NA	NA	NA	NA	NA	NA
BRI-AT7500-D (LCD)*	NA	NA	NA	NA	NA	NA
BRI-IC8000-V (LCD)*	NA	NA	NA	NA	NA	NA
BRI-IC7000-V (LCD)*	NA	NA	NA	NA	NA	NA
BRI-IC6000-V (LCD)*	NA	NA	NA	NA	NA	NA

\*This equipment generates its own power internally or uses batteries for the console and has no outside power requirements.

\*\* The definition of a “shared” circuit is one that shares the same ground, neutral and hot/line with other equipment of the same type. Not more than 4 pieces of equipment may be on the same “shared” circuit and **NO OTHER** equipment may be on this circuit, i.e., refrigerators, drinking fountains, coolers or any other motorized appliance or lighting fixture.



**Single Pole Wall Receptacle**

An industrial grade 120vac 20amp double-pole single outlet wall receptacle is the preferred method of supplying power to treadmills. Using such an outlet prevents other appliances, such as vacuum cleaners, being plugged into the dedicated treadmill outlet.

# Proper Power Cord Connection and Placement

When connecting the power cord, plug the power cord into a dedicated non-looping isolated grounded circuit capable of carrying a minimum of 20amps (120VAC circuits). No other appliance, electrical component, device or light fixture may be on the same circuit.

Do not use any extension cord. Do not modify the cord or use an adapter to connect the power cord to an improper power receptacle.

Do not use a ground plug adapter to adapt the power cord to a non-grounded outlet.

A temporary adapter **MUST NOT BE USED** to connect this plug to a two-pole receptacle. If a properly grounded, 20-amp outlet is not available, one must be installed by a qualified electrician.

Keep the power cord away from heated surfaces.

Do not run the power cord across an area where it may become a tripping hazard or have the potential of receiving damage from objects rolling over the cord.



**Attention:** Obtain the assistance of a licensed electrician before installing, modifying or servicing any part of the electrical power supply for your equipment.

## Facility Power Requirements

When designing a facility or installing new Brigadoon Fitness equipment into an existing facility, it is necessary to have the correct electrical power provisions. Without proper electrical supply, the equipment will not operate in a safe and proper manner.

Brigadoon Fitness requires a 20amp dedicated circuit and dedicated neutral for each treadmill installed and operated. Each treadmill must be furnished with an Individual Branch Circuit (also known as a “dedicated” circuit). Circuits for 110 Volt models must include a 20amp circuit breaker and individual 20amp outlet (NEMA 5-20R) for each treadmill, per NFPA70 National Electrical Code (NEC) clause 210.21(B) (1). The NEC requires that each outlet have dedicated conductors of at least 12 AWG for line, neutral and ground for 20amp service. Larger conductors (10 AWG) may be required for long branch circuits or high temperatures to prevent voltage drop.

Dedicated outlets must not share line, neutral or ground conductors with other outlets. This means that a single breaker, one hot wire, one neutral wire, and one ground wire are connected from the panel to a single electrical load (in this case, 1 treadmill). All circuits for treadmills SHOULD NOT SHARE A NEUTRAL OR A GROUND. Each neutral wire and each ground wire should be tied back to the panel directly.

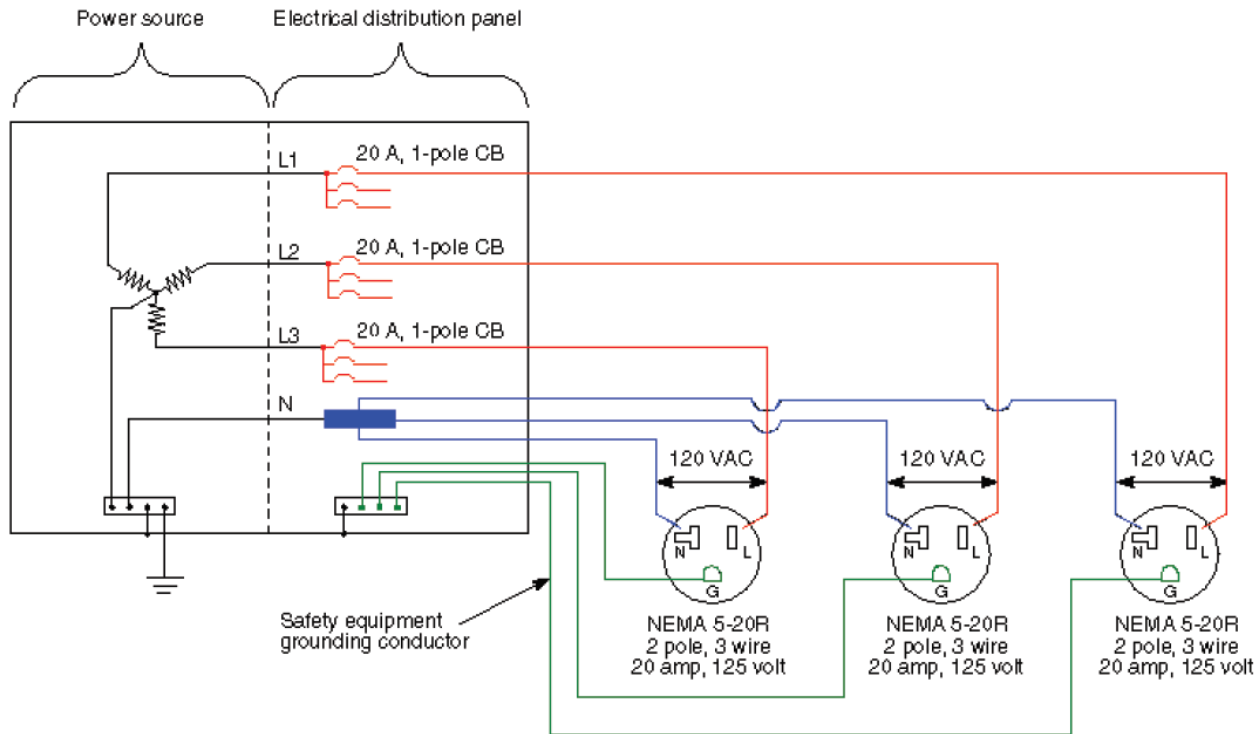


Diagram of appropriate wiring for multiple treadmills

There should be no other electrical device operated off this circuit; just the single treadmill. The earth ground connection of the outlet may be shared with other outlets' earth ground connections through either metal conduit or ground wire. Each dedicated circuit requires 12gauge wire for the line and neutral wires for runs less than 100 feet, as measured from the circuit breaker to the termination of the plug (outlet) connecting to the treadmill. Runs greater than 100 feet require 10gauge wires, and a run from a circuit breaker shall not be greater than 200 feet.

Proper power supply will avoid common problems caused by an improper power supply such as:

### Over-loading the circuit breaker

With only one treadmill connected to a single circuit breaker in the electrical panel, the smaller circuit breaker in the treadmill will trip first if there is an over-current situation due to abnormal treadmill operation. If more than one treadmill is wired to the same panel breaker, the additional current requirements may frequently overload and trip the panel breaker, even though the treadmills are operating normally.

### Over-loading the Neutral wire

If there are multiple treadmills connected to the same neutral wire, even if each hot conductor is wired to separate breakers, there is a risk of over-loading the neutral wire, possibly resulting in a dangerous situation (including overheating and danger of a fire) and/or, more commonly, low voltage at the outlet.

### Low Voltage at the outlet

This can be caused by several things. The most common cause of low voltage is too many treadmills on one circuit (or neutral wire), which overloads the wire, heats it up, and causes the voltage at the outlet to drop. This can also happen if the wires are not the correct size, or if the distance from the panel to the outlet is too far. Low voltage at the outlet can only be measured when the load is at its peak. The voltage may be acceptable when all the treadmills are off, but lower significantly when all treadmills are all on and drawing 15 amps. Low voltage causes problems for the motor and Motor Control Board (MCB), and can result in electrical failure.

## NEC (National Electrical Code)

The National Electrical Code (NEC), or NFPA 70, is a U.S. standard for the safe installation of electrical wiring and equipment. It is part of the National Fire Codes series published by the National Fire Protection Association (NFPA). “National Electrical Code” and “NEC” are registered trademarks of the NFPA. While the NEC is not itself a U.S. law, NEC use is commonly mandated by state or local law, as well as in many jurisdictions outside of the United States. The NEC codifies the requirements for safe electrical installations into a single, standardized source.

### Details of selected NEC requirements

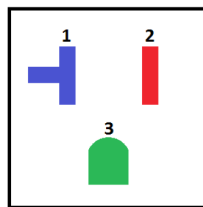
Articles 210 addresses “branch circuits” (as opposed to service or feeder circuits) and receptacles and fixtures on branch circuits. There are requirements for the minimum number of branches, and placement of receptacles, according to the location and purpose of the receptacle outlet.

As of 1962 the NEC required that new 110-volt household receptacle outlets, for general purpose use, be both grounded and polarized. NEMA has implemented this in its U.S. standard socket configurations so that:

1. There must be a slot for a center-line, rounded pin connected to a common grounding conductor.
2. The two blade-shaped slots must be of differing sizes, to prevent ungrounded (2-wire) devices which use “neutral” as their only grounding from being misconnected.



Wall Receptacle



1. NEUTRAL
2. HOT/LINE
3. GROUND



Equipment Plug

## Actual vs. Maximum Current Rating

A 20-amp fuse or circuit breaker is not actually intended to routinely carry 20 amps of power. In actual fact, a given circuit may only carry up to 80% of its maximum-rated capacity, with the remaining 20% intended as a safety margin.

Maximum Rated Circuit Capacity	Actual Rated Circuit Capacity
10 amps	8 amps
15 amps	12 amps
20 amps	16 amps

## Isolated Circuits

The term “Isolated” has been misused in the past to describe an individual branch circuit. An Isolated circuit actually describes an electrical power circuit that is isolated from the rest of the electrical power in the building through a separate transformer. Brigadoon Fitness equipment does not require isolated circuits. This is usually used only for equipment that is very sensitive to electrical noise in the power lines.

If there is a concern about EMI/RFI interference, we suggest the use of a local power conditioner to clean the signal and help eliminate interference or “cross talk”. Good units start at a range of 40 to 60db for noise filtering.