

Service Bulletin

Power Requirements

Applies to: All Machines



The purpose of this document is to specify the power requirements for Core Health and Fitness LLC equipment.



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 Core Health and Fitness LLC 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.

Core requires a 20 amp 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 20 amp circuit breaker and individual 20 amp outlet (NEMA 5-20R) for each treadmill, per NFPA70 National Electrical Code (NEC) clause 210.21(B) (1). Circuits for 220 Volt models must include a 15 amp circuit breaker and individual 15 amp outlet (NEMA 6-15R) for each treadmill. The NEC requires that each outlet have dedicated conductors of at least 12 AWG for line, neutral and ground for 20 amp 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.

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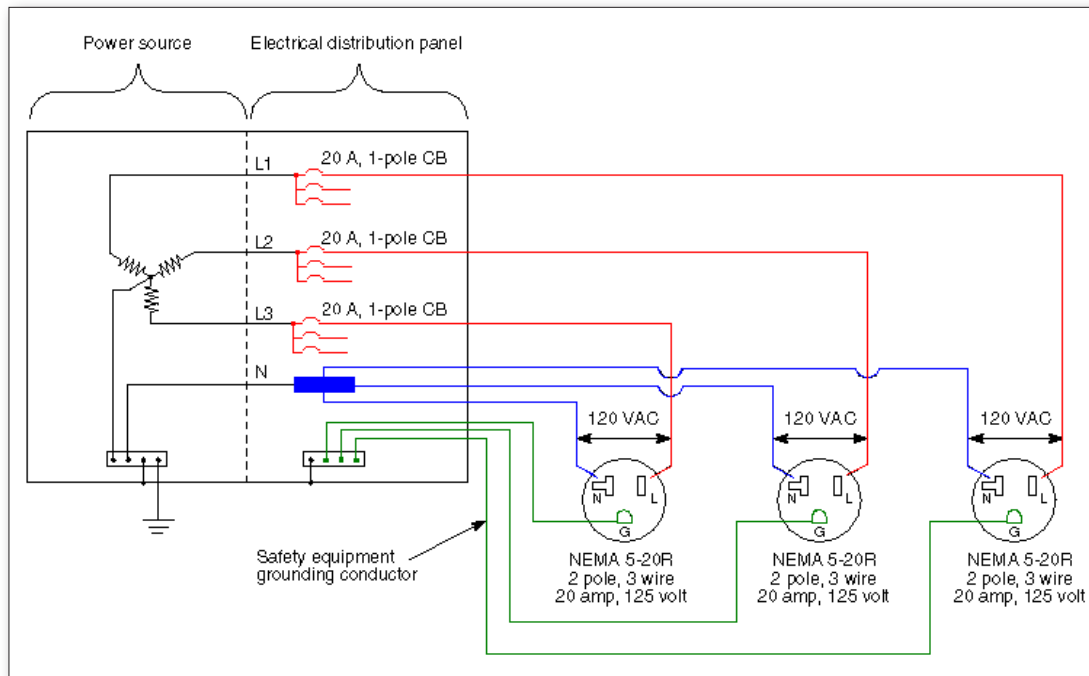


Diagram of appropriate wiring for multiple treadmills

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 12 gauge 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 10 gauge 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.

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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 MCB, and can result in electrical failure.

NEC (National Electrical Code)

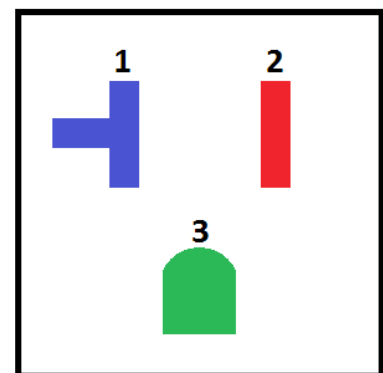
The National Electrical Code (NEC), or NFPA 70, is a U.S. standard for the safe installation of electrical wiring and equipment. It is part of the National Fire Codes series published by the National Fire Protection Association (NFPA). "National Electrical Code" and "NEC" are registered trademarks of 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. [1] 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.



1. **NEUTRAL**
2. **HOT/LINE**
3. **GROUND**

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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. Star Trac® equipment does not require isolated circuits. This is usually used only for equipment that is very sensitive to electrical noise in the power lines.

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Facility Power Information

Product Series	Line Voltage (V)	Line Frequency (Hz)	Current (RMS Amp)	Circuit Configuration	Outlet	Max Power Dissipation (Watt)
TreadClimber¹	110	50-60Hz	20	Dedicated	NEMA 5-20	1650
8-TC, E-TC	220	50-60Hz	15	Dedicated	NEMA 6-15	1650
8 Series Treadmill¹	110	50-60Hz	20	Dedicated	NEMA 5-20	1650
8-TRx, 8-TR	220	50-60Hz	15	Dedicated	NEMA 6-15	1650
E Series Treadmill¹	110	50-60Hz	20	Dedicated	NEMA 5-20	1650
E-TRxe, E-TRxi, E-TRx, E-TRe, E-TRi, E-TR	220	50-60Hz	15	Dedicated	NEMA 6-15	1650
S Series Treadmill¹	110	50-60Hz	20	Dedicated	NEMA 5-20	1650
S-TRc, S-TRx, S-TR	220	50-60Hz	15	Dedicated	NEMA 6-15	1650
Bikes with Entertainment²	12VDC 5A	N/A	N/A	N/A	N/A	365
E-UBe, E-RBe, E-UBi, E-RBi, S-UBx, S-RBx						
Bikes³	N/A	N/A	N/A	N/A	N/A	300
8-UB, 8-RB, E-UB, E-RB, P-UB, P-RB, U-UBx, S-RBx, S-UB, S-RB						
TBT with Entertainment²	12VDC 5A	N/A	N/A	N/A	N/A	365
E-TBTe, E-TBTi, S-TBTx						
Crosstrainers³	N/A	N/A	N/A	N/A	N/A	300
8-CT, 8-RDE, E-TBT, P-TBTx, P-TBT, S-TBTx, S-TBT						
Stepper with Entertainment²	12VDC 5A	N/A	N/A	N/A	N/A	365
E-Ste, E-STi						
Stepper³	N/A	N/A	N/A	N/A	N/A	300
8FC, S-ST, P-ST						
Stairmill	12VDC 5A	N/A	N/A	N/A	N/A	365
8G, Gauntlet. E-SM, SM5, SM916						

Notes:

1. All Star Trac[®] treadmills must be connected to a Dedicated / Individual Branch Circuit.
2. Star Trac[®] products with Entertainment (TV Screens) have an external AC Adapter (12VDC, 65 Watt). The Power Dissipation includes energy expended in resistance mechanism for the purpose of facility environmental engineering.
3. Self-powered products: Power Dissipation reflects energy expended in resistance mechanism for the purpose of facility environmental engineering.