

# HOT TUBS & SPAS - ELECTRICAL WIRING REQUIREMENTS

## 2014 National Electrical Code

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**SPA OR HOT TUB.** A HYDROMASSAGE POOL, OR TUB FOR RECREATIONAL OR THERAPEUTIC USE, NOT LOCATED IN HEALTH CARE FACILITIES, DESIGNED FOR IMMERSION OF USERS, AND USUALLY HAVING A FILTER, HEATER, AND MOTOR-DRIVEN BLOWER. THEY ARE INSTALLED INDOORS OR OUTDOORS, ON THE GROUND OR SUPPORTING STRUCTURE, OR IN THE GROUND OR SUPPORTING STRUCTURE. GENERALLY, A SPA OR HOT TUB IS NOT DESIGNED OR INTENDED TO HAVE ITS CONTENTS DRAINED OR DISCHARGED AFTER EACH USE.

### 1) Hot Tub / Spa Wiring Method and Receptacles (Outlets)

- a. Maintenance Disconnect - A disconnect is required for all ungrounded electrical wires (except for lighting). It must be at least 5' but not more than 50' from the water's edge, readily accessible, and within sight of the Hot Tub / Spa.
- b. The outlet(s) that supply a Hot Tub / Spa must be Ground-Fault Circuit Interrupter (GFCI) protected.
- c. Indoors Hot Tubs & Spas
  - i. At least one (1) convenience receptacle must be located between 6' and 10' from the inside wall of the Hot Tub / Spa and be GFCI Protected (Existing receptacle OK and wired with any approved wiring method).
- d. Outdoors Hot Tubs & Spas
  - i. At least one (1) convenience receptacle must be located between 6' and 20' from the inside wall of the Hot Tub / Spa and be GFCI Protected (Existing receptacle OK and wired with any approved wiring method).
  - ii. Liquidtight flexible metal or nonmetallic conduit is permitted in lengths of not more than 6'.
  - iii. A listed packaged hot tub / spa installed outdoors that is GFCI protected shall be permitted to be cord and plug-connected provided that such cord does not exceed 15 feet in length.
  - iv. Outdoor receptacles must have a weatherproof cover where exposed to the weather (In-use type cover required on used, unattended, receptacles in wet locations).

### 2) Bonding The Hot Tub / Spa

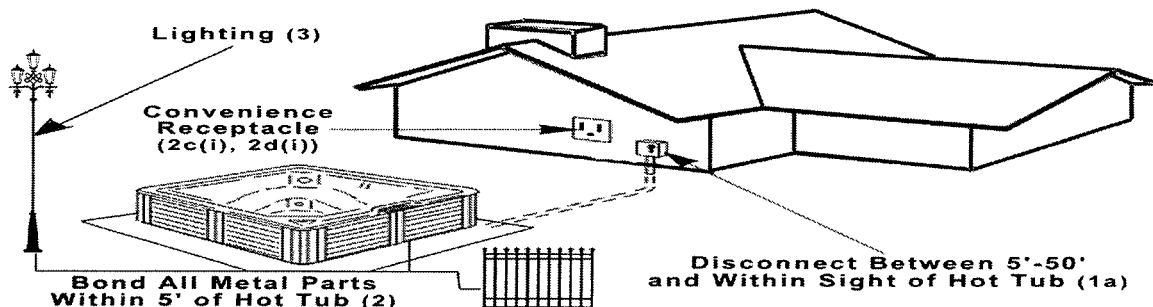
- a. All metal parts & surfaces within 5' of the Hot Tub / Spa must be bonded together using a #8 (or larger) solid copper wire and connections must be non-corrosive.
- b. Outdoor Hot Tubs / Spas with nonconductive shells must have a #8 (or larger) solid, bare copper wire 18"-24" from the inside hot tub wall under the perimeter surface 4"-6" below the final grade and connected to a metal part of the pump motor.\*  
\* Exception: All must apply; 1) Hot tub must be listed for aboveground use, 2) Listed for outdoor use, 3) Installed on or aboveground, 4) The top rim of the hot tub must be at least 28" above the perimeter surfaces within 30" horizontally.

### 3) Lighting (other than underwater applications) (if any)

- a. All non-GFCI protected lights and ceiling fans within 5' of the inside wall of the Hot Tub / Spa must be at least 12' above the maximum water level of the Hot Tub / Spa.
- b. All GFCI protected lights and ceiling fans within 5' of the inside wall of the Hot Tub / Spa must be at least 7 ½' above the maximum water level of the Hot Tub / Spa.
- c. Exception - Lights that are within 5' of the inside wall of the Hot Tub / Spa and less than 7 ½' above the water level are only acceptable if they meet the following:
  - i. Recessed Lights - GFCI protected with a glass or plastic lens, nonmetallic or electrically isolated metal trim, and suitable for damp locations.
  - ii. Surface-Mounted Lights - GFCI protected with a glass or plastic globe, a nonmetallic body, or a metallic body isolated from contact, and suitable for damp locations.

### 4) Other

- a. Building Permits are required. Always secure a Building Permit from your municipality prior to beginning work.
- b. Indoor Hot Tubs / Spas wall switches must be a minimum 5' from the inside wall of the Hot Tub / Spa.
- c. Outdoor Hot Tubs check for overhead wires within 10' of the Hot Tub. (Must be 22 ½' above water level & not allowed in many towns)
- d. All Hot Tubs / Spas, other than in a single family residence, must have an emergency shutoff between 5'-50' & within sight.



# PERMANENTLY INSTALLED SWIMMING POOLS

## ELECTRICAL WIRING REQUIREMENTS

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PERMANENTLY INSTALLED SWIMMING POOLS ARE THOSE THAT ARE CONSTRUCTED IN THE GROUND OR PARTIALLY IN THE GROUND, AND ALL OTHERS CAPABLE OF HOLDING WATER WITH A DEPTH GREATER THAN 42 INCHES (1067 MM)

#### 1) Pool Pump Receptacle (Outlet) and Wiring Method

- a. If a pump motor receptacle is located between 6' – 10' from the inside pool wall, the receptacle must be a single outlet, grounded, and Ground Fault Circuit Interrupter (GFCI) protected.
- b. Receptacle must have an extra-duty, in-use, weatherproof cover that can be closed when the cord is plugged in.
- c. The circuit line for the pump motor must be a continuous line going directly to the panel box, and is to be isolated from all other receptacles.
- d. Wire for the pump motor shall not be less than #12 AWG insulated copper grounded wire, and must be in conduit. (Exception: When entering a building the wire can change to NM) (Cannot use NM wire in conduit).
- e. Conduit
  - i. PVC – All PVC conduit\* must be buried at least 18" deep (12" if GFCI protected).
  - ii. Metal – All Rigid Metal Conduit\* must be at least 6" deep.

\* Wires used in conduit must be single strand wires (ex: THWN, etc - NO NM or UF CABLE in Conduit).

#### 2) Convenience Receptacle (Outlet) and Wiring Method

- a. At least one (1) 15- or 20-ampere convenience receptacle must be located not closer than 6' but not further than 20' from the outside pool wall (Can be existing and/or wired with any approved wiring method).
- b. Convenience receptacle must be Ground Fault Circuit Interrupter (GFCI) protected, Tamper Resistant (TR), and Weather Resistant (WR) type receptacle.
- c. Must have an extra-duty, in-use, weatherproof cover that can be closed when in use (for all wet locations).
- d. Must be separate from the pool pump receptacle wiring.
- e. Wiring
  - i. UF cable if buried must be at least 24" deep.
  - ii. PVC – All PVC conduits\* must be buried at least 18" deep (12" if GFCI protected).
  - iii. Metal – All Rigid Metal Conduits\* must be at least 6" deep

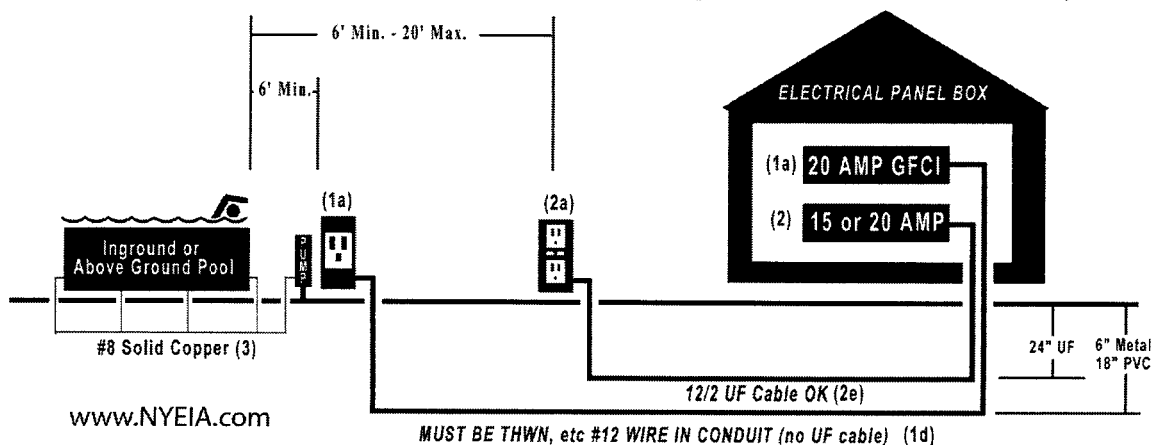
\* Wires used in conduit must be single strand wires (ex: THWN, etc. - NO NM or UF CABLE in Conduit).

#### 3) Bonding The Pool

- a. All metal parts must be bonded together using a #8 (or larger) solid copper wire.
- b. Must use non-corrosive clamps.
- c. Conductive pool shells must be bonded in a minimum of four (4) equal points uniformly spaced around the pool
- d. Nonconductive pool shells must have a #8 (or larger) solid, bare copper wire 18"-24" from the inside pool wall under the perimeter surface 4"-6" below the final grade.
- e. A minimum of nine (9) square inches of corrosion resistant metal must be in the water to bond the water.

#### 4) Other

- a. Building Permits are required. Secure a Building Permit from your municipality prior to beginning work.
- b. Pool Alarms are required. (Check with your local Building Department for additional information).
- c. Pool Pump Timers: (Check with your local Building Department for additional information).



# STORABLE SWIMMING POOLS, SPAS, & HOT TUBS

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**STORABLE POOLS** ARE THOSE THAT ARE CONSTRUCTED ON OR ABOVE THE GROUND, AND ARE CAPABLE OF HOLDING WATER TO A MAXIMUM DEPTH OF 42 IN., OR A POOL, SPA, OR HOT TUB WITH NON METALLIC, MOLDED POLYMERIC WALLS, OR INFLATABLE FABRIC WALLS REGARDLESS OF DIMENSION. (The maximum water depth of 42" does not apply to inflatable swimming pools.)

### 1) Storable Pool Pumps

- a. A cord-connected pool filter must incorporate an approved system of double insulation or equivalent
- b. Cord-connected pool filter pumps must be provided with a ground-fault circuit interrupter (GFCI) that is an integral part of the attached plug or located in the power supply cord within 12" of the attached plug.

### 2) Receptacle (Outlet) and Wiring Method for Storable Pool Pump

- a. Receptacles cannot be located within 6' of the inside wall of a storable pool.
- b. The receptacle must be grounded, must be Ground Fault Circuit Interrupter (GFCI) protected, and the Tamper Resistant (TR), and Weather Resistant (WR) type receptacle.
- c. Receptacle must have an In-use, extra-duty weatherproof cover that can be closed when the cord is plugged in.
- d. An Automatic Timer (Time Switch) must be installed on storable swimming pool pumps.

### 3) Luminaries (lights) for Storable Pools (if used)

- a. Luminaries cannot have exposed metal parts and must be listed for the purpose.
- b. Luminaries 15 Volts or less must:
  - i. Have a luminaire lamp that operates at 15 volts or less
  - ii. Have an impact-resistant polymeric lens, luminaire body, and a transformer enclosure
  - iii. Have a transformer listed for swimming pools with a primary rating not over 150 volts
- c. Luminaries Over 15 Volts but not over 150 volts must:
  - i. Have an impact-resistant polymeric lens and luminaire body
  - ii. Have Ground Fault Circuit Interrupter (GFCI) protection.

### 4) Other

- a. Building Permits are required. Secure a Building Permit from your municipality prior to beginning work.
- b. Pool Alarms may be required. (Check with your local Building Department for additional information.)
- c. All receptacles located within 20' of the inside walls of a storable pool wall must be GFCI protected.

