

Solar-Electric Tools of the Trade

Joe Schwartz

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Thinking about installing a solar-electric system? Having the right tools will allow you to get the job done quickly, done right, or done at all. If you have some electrical wiring experience or you're the type of person who undertakes household building projects, you likely have a pretty well-equipped shop or tool shed. In addition to standard hand tools like insulated screwdrivers, a socket set, and box and open-end wrenches, you'll need some specialized tools to install a solar-electric system.

Many of the tools that the pros use are described below. Once you have them, and learn to use them properly, a safe and professional installation becomes a possibility. Quality tools, like quality anything, aren't cheap, so plan to spend some money gearing up for your installation.

Many of these tools are useful for other projects around the house and definitely worth the investment. But before you buy a bunch of expensive tools that you may only use once, make sure to realistically gauge your ability to design and install an efficient, code-compliant, and safe system; consider hiring a pro to do the job for you. So either tool up, or take it easy and remain an armchair solar-electric installer. Here's my list of the tools of the trade—and brief descriptions of their use.



Angle Finder

Allows you to set your solar-electric modules to a precise tilt angle, or quickly determine the pitch of the roof you're planning to mount them on. US\$10–15

Solar Pathfinder

Helps you find the best location for your solar-electric array, by determining shading from trees or buildings for every hour of the day, every day of the year. US\$175–255



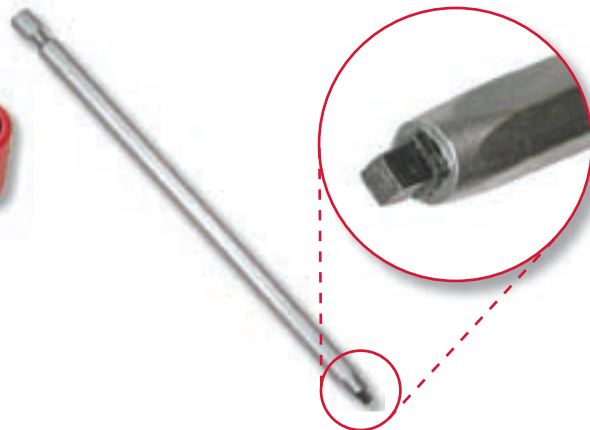
Cordless Drill

Fitted with a variety of bits, from square drive to Phillips to hex head, it can be used for lots of tasks, including quickly securing solar-electric module mounting hardware. US\$25–200

Right Angle Drill

High power, heavy-duty AC drill used for drilling or cutting holes for conduit or wire runs. Right angle design allows it to be used in tight spaces.

US\$250–300



Square-Drive Bits

Used with square-drive screws when mounting wiring enclosures or securing conduit straps. Long, square-drive bits make things easy since screws stay on the bits during positioning. US\$2–5

Hole Saw

Circular bit used with cordless and AC drills with a 1/2-inch chuck for cutting holes for conduit runs or in metallic or plastic wiring enclosures. US\$5–150 (set)



Cordless Reciprocating Saw

One of my favorite tools—perfect for quick and accurate cutting of Unistrut, and metallic and PVC conduit, without the hassle of extension cords or hacksaws. US\$100–180

Hole Punch

For multiple holes in metallic wiring enclosures, hole punches, also known as slug busters or chassis punches, quickly make clean, burr-free holes for conduit fittings. US\$150–700 (set)



Torque Wrench

Adjustable torque settings allow precise tightening of mounting rack hardware and wire terminations, according to equipment torque specifications. US\$40–180



Conduit Bender

EMT metallic conduit is one thing that makes a job look professional. Benders are used to create smooth curves, and accurate bends. US\$40–100

Fish Tape
A reel of stiff wire that is fed through installed conduit runs, and used to pull system wiring through the conduit. Lengths of 50 to 250 feet are common. US\$25–120



Torpedo Level

Short level used for accurate and straight mounting of wiring enclosures, conduit, and equipment. Level components look good, and will impress your neighbors. US\$5–30

Wire Stripper

Common electrical tool used for cutting and stripping small gauge wire. You probably already have one of these if you've done any wiring around the house. US\$10–50



Small Cable Cutters

For easy cutting of up to #6 wire, which is commonly used when installing AC wire runs between off-grid inverters and the mains panel. US\$20–40



Large Cable Cutters

Required when cutting large gauge wire like battery cables. Compact, ratcheting versions are also available and work well. US\$40–160

Small Crimper

Many pieces of solar equipment are fitted with stud posts that require ring terminals/lugs. Small crimpers are used to attach these connectors on #8 wire and smaller. US\$20–40



Large Crimper

Enables secure installation of ring lugs on large (typically #2/0 and #4/0) wire. Commonly used to make battery and inverter cables in off-grid systems. US\$180–220



Needle Nose Pliers

The perfect tool for feeding/pulling small wires through fittings, and aligning wires in terminals for tightening. Most have wire-cutting blades as well. US\$10–40

Lineman's Pliers
Excellent multipurpose pliers. Used for wire cutting, pulling, and twisting multiple wires together. US\$25–50



Slip-Joint Pliers

Adjustable pliers used for holding and tightening conduit fittings. Deluxe models have a quick and secure, ratcheting adjustment mechanism. US\$20–50

Nut Drivers

For hex head nuts and bolts. Hollow shaft allows clearance for long bolts. Used to remove wire enclosure covers and to fasten equipment ground screws. US\$5–50





Digital Multimeter (DMM)

A must-have tool for anyone doing solar-electric work. Most models measure AC and DC voltage and amperage, along with resistance and frequency. Shown with an optional clamp-on current probe for measuring higher amperage. US\$20–300

Access

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Quick Cable Corporation, 3700 Quick Drive, Franksville, WI 53126-0509 • 800-558-8667 • Fax: 800-733-8611 • sales@quickcable.com • www.quickcable.com • Large crimper

Thanks to our friends at Consolidated Electrical Distributors (CED) in Medford, Oregon, and Ashland Hardware in Ashland, Oregon, for letting *HP* Art Director Ben Root photograph some of the shiny new tools off their shelves, instead of the well worn and weathered tools on my truck.

