Hot-Water Recirculation Retrofit

by John Vastyan

For many homeowners, having to wait while the water flowing from the faucet or showerhead gets hot can be more than a minor nuisance. In large homes with long runs between the water heater and master bath, it can take more than a minute. Meanwhile, a lot of wasted cold water is running down the drain: Estimates of the amount range from 6,000 to 15,000 gallons of water per year for an average family of four, depending on the size of the home and the family's habits. Adding to the waste, a family might be paying for electricity to pump the water from a well and for chemicals to purify and treat it.

In new construction or during an extensive remodel, the best solution to the "I want hot water now" problem is to install a separate hot-water recirculation loop. In these systems, a small pump circulates water through a dedicated return line that runs from the end of the hot-water supply back to the hot-water heater. But until recently it's been a lot harder to retrofit a hot-water recirculation system to an existing home because of the difficulty of installing a dedicated return line.

A small thermostatic valve takes the place of a dedicated return line in this Grundfos hot-water recirculation system, which is specifically designed for retrofitting.

All images courtesy Grundfos

No Return Line Needed

The Grundfos Comfort System ($388 suggested list price; Grundfos Pumps Corp., 913/227-3400, www.grundfos.com) is a ready-for-retrofit pump and valve combo that doesn't need a return line. The pump is prewired with a 115-volt AC line cord that plugs into a standard outlet and installs easily at the hot-water heater; the valve connects to existing hot and cold lines with standard fittings and doesn't require a power supply. Installation of one of these systems takes only an hour or two.

The key to the unit is a simple thermostatic valve connecting the hot- and cold-water supply lines, which is installed beneath the fixture farthest from the house's hot-water source (see illustration, left). For plumbing systems with multiple branches, additional valves (which cost about $65 each) must be purchased for each branch at which instant hot water is desired. In most residential or light-commercial retrofit applications, a single pump and valve will be adequate, though separately plumbed branches may each require another valve.

When activated by its self-contained timer, the UP15-10S circulating pump installed at the hot-water tank pushes hot water toward the valve. As long as the water in the hot line is cooler than 95°F, the valve stays open, allowing

Installed between the hot and cold lines at the fixture farthest from the hot-water source, the valve (top left) circulates hot water back to the water heater via the cold-water line (top right). A small pump slowly moves water out through the hot-water line toward the thermostatic valve. With its integral timer, users can program the system to operate only when needed (above).

the water to slowly recirculate back toward the water heater through the cold-water line. While the pump is running, this continuous loop makes hot water instantly available at each tap within the circuit. When there's a demand for hot water and the water on the hot side of the valve exceeds 95°F, the valve starts to close, stopping circulation. The valve reopens when the hot-water temperature dips below the device-activated 95°F setpoint.

A Simple Nonelectric Thermostatic Valve

The system depends on the small pressure differential that the recirculating pump creates between the hot- and cold-water sides. As the water temperature increases or decreases, a thin wax filament within the valve enclosure expands and contracts, closing or opening the valve. At less than 95°F, the valve remains open to permit circulation through the water lines; at 95°F, the wax expands and the valve starts to close.

According to Grundfos, the valve never closes completely, which allows a slow trickle of water to pass through the valve and prevents the circuit from dead-heading. Because the cold-water line is used for recirculation, there is a slight rise of the cold-water temperature at the tap where the valve is installed whenever the system is in operation.

The specially designed pump circulates water at a rate of one-tenth of a gallon per minute, so flow rate is minimal. And if the valve at the fixture is closed while the pump is operating, the pump will not burn out, Grundfos says.

While the Comfort System reduces net water usage, actual energy consumption for water heating will increase slightly. But because a timer controls the pump, the system can be programmed to run only during the hours when the homeowners need hot water, keeping the energy penalty at a minimum.

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LED to Light.

Night-vision goggles don't make practical sleepwear, which is why the *NL-04* and *NL-05 High/Low LED Night Lights* are such a great solution to a dark bathroom. Each lamp provides constant low-level illumination until its sensor detects movement; then it raises output to an ambient level. A photocell shuts off the light during daylight hours. LEDs (light-emitting diodes) use little energy and last somewhere close to forever. The fixtures costs $24.95 and $27.95.

American Lighting, 800/880-1180, www.americanlighting.com.

Glass Drops.

Whether installed suite-style with a matching glass vessel lav by the same maker, or used as color accents in another decorative scheme, these individually blown glass *Pendant Lights* lend a bathroom good task lighting and a classy presence. Complete low-voltage fixtures cost between $325 and $375, depending on color; globes may be purchased separately for $145 to $195 and used with other standard hardware.

Bear Creek Glass, 205/324-9339, www.bearcreekglass.com.

Suite Selection.

Part of a coordinating suite of bathroom accessories that includes rings, bars, hooks, mirrors, and more, the *Empire Single* and *Double Lights* feature blown-glass shades and are rated for maximum–100-watt incandescent lamps. Metal finish options include chrome, brass, nickel, and satin nickel. The sconces cost between $215 and $395, depending on finish and configuration.

Ginger, 888/469-6511, www.gingerco.com.

Compact Unit. For kitchens in which every inch counts, the 23-inch-long by 20 1/4-inch-wide *KM360G* four-burner gas cooktop delivers high performance within a compact footprint. The stainless-steel unit boasts a 10,200-Btu burner, two 6,000-Btu burners, and a 3,400-Btu auxiliary burner; a continuous-grate design allows pots to be shifted between burners without lifting. The cooktop costs $799.

Miele, 800/843-7231, www.miele.com.

Stainless or Porcelain. The stainless-steel surface and continuous grates on the snappy-looking *Architect Series* five-burner gas cooktop make for efficient cooking and cleaning. Burner output ranges from 6,000 to 14,000 Btu. The unit retails for $979; a similar model with a porcelain-on-steel finish in white, biscuit, or black sells for $829.

KitchenAid, 800/422-1230, www.kitchenaid.com.

Smart Burners. This electric cooktop's sensor technology automatically adjusts its three-element burner to the size of the cookware and then shuts the burner off when the cookware's removed. Once the pan's replaced, the burner resumes its previous setting. Electronic touch controls provide simple operation and a pristine ceramic cooking surface. Choose from three widths — 30, 36, and 45 inches — and two colors, black and white. The *CEP 36* model shown has a suggested retail price of $1,499.

Thermador, 800/735-5547, www.thermador.com.

Introducing Induction. There's a new kind of heat out there and it's pretty cool. Literally. The *Diva Induction Cooktop* uses magnetic induction to warm a container and its contents. While the cooking surface itself remains cool, water boils in half the time required by a gas or electric cooking element, the company says. Only magnetically attractive cookware can be used, but a five-piece set of stainless-steel pots comes standard with every purchase. The three cooktop sizes — 12-inch, 30-inch, and 36-inch — cost $1,995, $2,995, and $3,995, respectively.

Diva de Provence, 888/852-8604, www.divainduction.com.