

The Evolution  
of Service  
Valves: New  
Technology  
for Tankless  
Water Heaters

The popularity of tankless water heaters continues to grow for good reason: higher operating efficiency yields lower water heating costs and a compact design allows for installation in spaces where a conventional storage-type water heater would not fit.

Challenges begin to arise, however, when tankless water heaters are installed in these smaller spaces. Accessing service valves for installation and servicing becomes more difficult in the cramped, complex space under the heater, and traditional service valves present a set of challenges of their own.

### **The Sticky Ball Valve Situation**

When used in a tankless water heater application for isolation and servicing purposes, the ball valve presents some unique challenges. Perhaps the biggest challenge is the high torque required to rotate the ball, which by design is pre-loaded against a Teflon seat. This pre-loaded tension of the ball against the seat allows for reliable shut-off capability.

Along with high handle torque, compounded by the T-handle design typically used in TWH applications, the Teflon seat can deform under the pre-loaded ball, especially in hot water applications. This is one cause of the common “sticking” often experienced with ball valves, where the edge of the opening in the ball must overcome deformation in the seat to turn. Another cause of a stuck ball valve is corrosion of the ball itself, which can lead to the valve becoming inoperable and requiring replacement.

Between a design that normally requires high handle torque, the potential for sticking, the limited leverage of the T-handle, and the cramped space under a tankless water heater, it can be a challenge just to open or close a typical ball valve when servicing is required.

### **The One-Size-Fits-All Challenge**

While there are a variety of TWH service valve configurations available today, none of them provide a great deal of flexibility in terms of positioning the ball valve T-handle, the relief valve, and the drain valve in relation to one another.

Positioning the hot-side valve under the heater typically requires compromise in accessibility of the T-handle and drain valve, and positioning the relief valve so it will not interfere with other components under the heater can be a challenge. This is especially true when the heater is installed close to an adjacent wall on the left side, where only minimal clearance is required to remove the cover and service internal components.

With tight spaces for water heating equipment becoming more common, ideally positioning the typical TWH service valve under the water heater can be difficult.

### **The Ugly Valve**

Let's face it, plumbing valves are not intended to be a work of art. They are strictly utilitarian devices that are typically kept out of sight in utility rooms, behind appliances, or in access panels.

The growing popularity of tankless water heaters, along with the greatly reduced space they require, has led to these appliances often being installed in areas that are in plain view of the occupants. Like the typical kitchen appliance, the heaters themselves are equipped with attractive covers making them suitable for installation in non-hidden areas. Unlike the plumbing that is hidden in the cabinet under the kitchen sink, today's installation contractor must keep the aesthetics of their tankless water heater installation in mind to satisfy their increasingly savvy customers.

While the appearance of the plumbing, gas, and electrical lines to the heater can be addressed in a variety of ways, there is no escaping the aesthetic qualities of the TWH service valves that are in prominent view under the heater. It is well known that products that are more aesthetically pleasing are preferred over those that are not, and this most certainly applies as well to the components required for a tankless water heater installation.

### **Overcoming the Challenges with New Valve Technology**

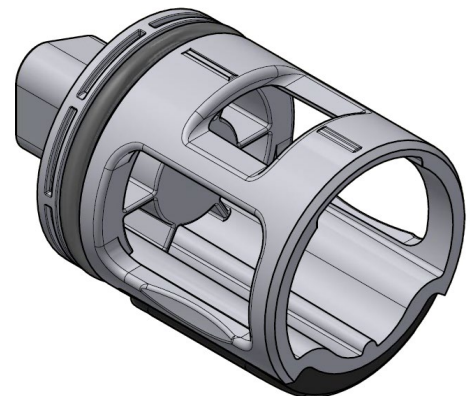
In the past, traditional ball valves have presented challenges in tankless water heater applications: high handle torque, sticking, lack of flexibility, and an undesirable appearance. For a successful tankless water heater application, look for a valve that has these qualities:

1. A valve with exceptionally long service life
2. A valve that is easy to operate with consistently low handle torque
3. A valve that requires a minimum of space under the heater
4. A valve that can be field-configured to best fit tight installations
5. An aesthetically pleasing valve that will not detract from the looks of the appliance

### **Long Service Life**

Like the modern design of high-end faucets, service valves should be able to endure tens of thousands of opening and closing operations and remain reliable over their entire service life. This is made possible by utilizing the same materials and manufacturing of rotor technology, a highly-engineered component with the following properties:

- Extreme dimensional stability over a wide range of temperature
- High corrosion resistance, made entirely of non-metallic materials
- Internally lubricated, pressure-activated seal that does not rely on mechanical compression

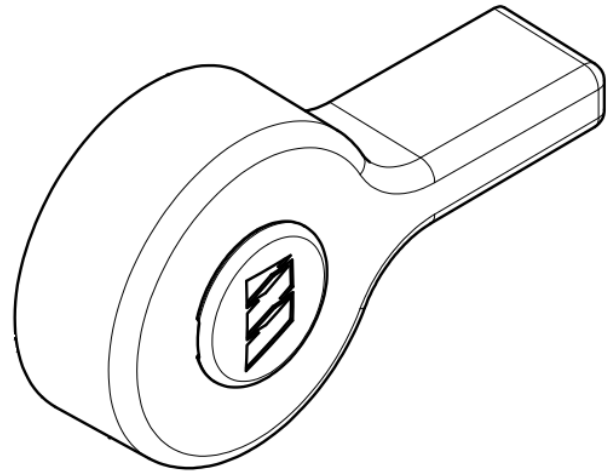


These properties contribute to the design objectives of consistently low handle torque and provide reliable operation over a wide range of temperatures and pressures for a long service life.

### **Easy-to-Operate, Low-Torque Handle**

Unlike the usual utilitarian ball valve handle that can be difficult to turn, look for an ergonomic handle design that is easy to grasp and turn.

Tight spaces and hot surfaces can make getting a good grip on the valve handle a challenge. In combination with a low-torque valve design, valves that open and close smoothly with minimal effort allows for easier operation in tight spaces. In such cases, getting a full hand grip on the small T-handle of a ball valve can be difficult, and it is sometimes impossible to turn the handle without using pliers or a wrench.



Look for a valve design that is easy to use to help speed up your tankless water heater service calls.

### **Compact Body Design**

Cramped spaces under tankless water heaters can be difficult to access. Consider a valve with a smaller, compact body that is intended to require minimal space under the heater.

Originally intended to replace separate valves and fittings to be assembled on the jobsite, tankless water heater service valve kits not only speed up installation time and reduce leak paths, but they also conserve space under the heater. Newer TWH valve designs have greatly reduced the vertical space needed for the connection of the plumbing lines to the heater. This not only results in a more compact installation, but also in a cleaner, more professional-appearing installation.

### **Field Configurability**

When selecting a tankless water heater service valve, consider the valve's ability to be field configured. As mentioned above, modern TWH valve designs have reduced the vertical space required under the heater to make the plumbing connections, but in the process have packed more components into a tighter space. This tighter space can make arranging these components a challenge, especially positioning the valve handles, drain ports, and the pressure relief valve. Every tankless water heater is

different, as is every installation, so the use of a “one-size-fits-all” TWH valve kit usually results in less-than-optimum results.

A better choice is to select a TWH valve kit that offers flexibility in how the valve handles, drain ports, and relief valve can be positioned in relation to one another in a compact space. Not only will a field configurable valve provide greater ease of installation, but it will also make operation of the valve easier when the heater needs to be serviced.

### **A Good-Looking Valve**

Since tankless water heaters require less space and can be installed in more visible spaces around the home, consider the aesthetic design of service valves.

Today’s appliance consumer is more tech-savvy and quality-demanding than those of the past. Modern appliances are now considered as much, or more, of an interior design statement as the function they provide. Like a refrigerator, stove, or dishwasher, modern tankless water heaters are often installed in plain sight of the occupants and therefore must compliment the aesthetic qualities of other appliances.

Considering this, the mechanical connections to the heater must not detract from the visual appeal of the appliance. The service valves are generally the most visible component of those connections, so selecting a valve set with a modern appearance will enhance the visual appeal of the installation.

### **Simplified Installation & Maintenance of Tankless Water Heaters**

Tankless water heaters are a space-saving, energy-efficient alternative for many homes. But old ball valves present headaches for contractors and installers with sticking handles, lack of flexibility, and a less-than-desirable appearance.

Thanks to new valve technology, these headaches can be eliminated. New tankless water heater service valve sets overcome the challenges presented by traditional ball valves. With advanced valve technology and field configurability, new TWH valve sets provide easier installation and faster servicing, all while providing exceptionally long service life and the aesthetic qualities that appeal to the most demanding of modern appliance consumers.

