

RAVEqc Quick-Connect Air Valves

Overview

RAVEqc quick-connect air valves represent another example of the Restek Air Valve Excellence (RAVE) family of products. RAVEqc quick-connect air valves allow you to make fast, tool-free connections to your air canisters and associated hardware.

Principle of Operation

RAVEqc quick-connect air valves are mated pairs of valves (i.e., one male and one female) that operate on the principle that when the two are disconnected, the valves are closed.* Connecting the two opens the valve in each part, establishing flow between them. In this manner, RAVEqc quick-connect air valves serve as both a means of connecting two devices and also as the valve that permits flow into or out of the devices being connected.

Important Considerations for the Installation and Operation of RAVEqc Quick-Connect Air Valves

1. When the male and female RAVEqc quick-connect air valves are connected, the two devices they connect can freely rotate (Figure 1). This is normal and does not indicate a problem with the connection or the integrity of the seal. However, applying a lateral force to the valve while rotating may result in the loosening of the threaded cap found on the end of the male RAVEqc quick-connect air valve (Figure 2). This threaded cap has been installed using a specific torque. While this torque should be sufficient to prevent the cap from being unthreaded during normal use, it is strongly recommended that the male RAVEqc quick-connect air valve not be rotated if lateral force is applied.
2. Note that the evacuation and fill rates for a RAVEqc quick-connect air valve will be slower than those observed for a traditional diaphragm valve. The table below compares typical flow rates for RAVEqc quick-connect air valves and RAVE diaphragm valves, as well as the time it typically takes for a 6 L air canister to collect a grab sample.

Valve	Max Flow @ 29" Hg (mL/min)*	6 L Grab Sample Time (sec)
RAVEqc quick-connect air valve	2,500	240
RAVEqc high-flow quick-connect air valve	3,850	120
RAVE diaphragm valve	40,000	10

* Flow rates calculated on a ¼" platform.

3. RAVEqc quick-connect air valves should be cleaned like traditional diaphragm valves (i.e., part of the sample train) in a canister cleaning oven. (High-flow valve option facilitates use with canister cleaning ovens.) Do not exceed the following maximum recommended temperatures:
 - a. 80 °C for a SilcoCan canister with a coated RAVEqc quick-connect air valve cleaned in the presence of oxygen.
 - b. 140 °C for a TO-Can or SilcoCan canister with a coated or uncoated RAVEqc quick-connect air valve cleaned in the presence of an inert gas.

Warning: If you are using a RAVEqc quick-connect air valve on a canister with a gauge, do not exceed 120 °C.

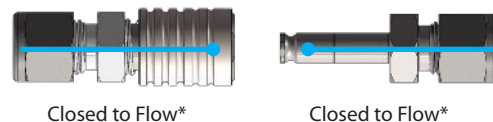
4. To avoid the introduction of foreign material (e.g., dust) into RAVEqc quick-connect air valves, store them in a clean environment and use RAVEqc caps (cat.#s 27353, 27354) to protect all male RAVEqc valves from physical damage.

Initial Installation of RAVEqc Quick-Connect Air Valves to Air Canisters and Other Hardware

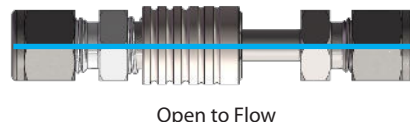
Each RAVEqc quick-connect air valve type is composed of two halves. One half is the valve end, which is either male or female in design. The other half is a common fitting end that is used to connect the valve half to a wide range of devices that use standard compression or tube end fittings. Examples of common fitting ends include ¼" compression fittings or tube ends that can be connected to compression fittings.

- To successfully connect your RAVEqc quick-connect air valve to another device (e.g., air canister, flow controller, cleaning oven, etc.), you must ensure that a proper connection has been made between the compression or tube end fitting and the device itself. To do so, use standard procedures (as described by Swagelok or Parker, for instance) for making these types of connections.

Disconnected RAVEqc Valves



Connected RAVEqc Valves



* Open-position option also available to prevent vacuum/pressure from being trapped by the valve when desired (e.g., when using a vacuum/pressure gauge).

Figure 1

Free rotation is normal



Figure 2

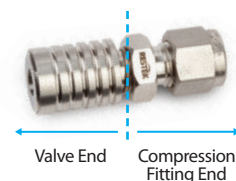
Don't apply lateral force to the valve while rotating



Male RAVEqc Valve to Tube End Fitting, Short (1.23")

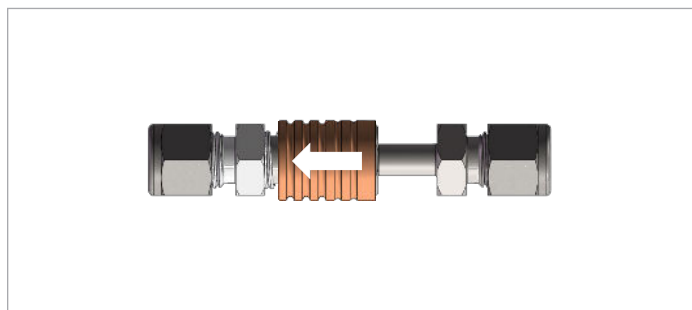
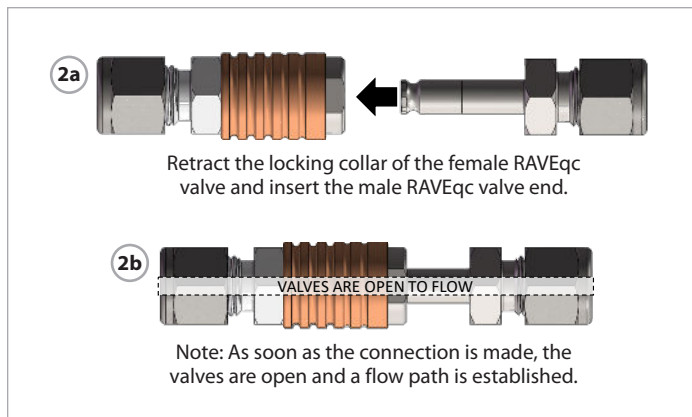
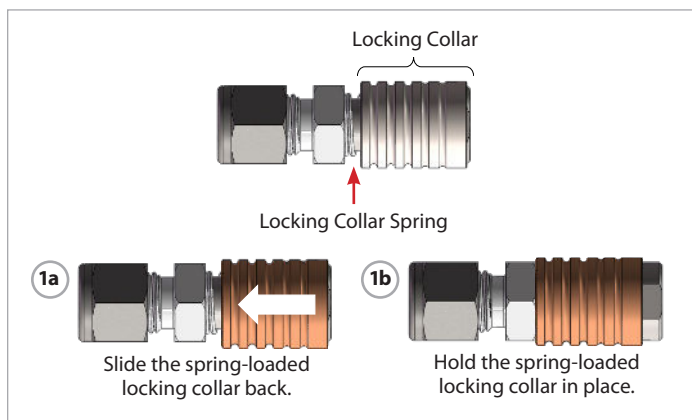


Female RAVEqc Valve to ¼" Male Compression Fitting



- When using male tube end fitting RAVEqc quick-connect air valves (e.g., cat.#s 27371, 27373) with nut and two-piece ferrule sets (e.g., cat.# 23161), we recommend pre-seating the front and back ferrules using an appropriate swaging tool (e.g., cat.# 22622 for 1/4" fittings) to ensure a proper connection.
- If installing a RAVEqc quick-connect air valve with a compression fitting (e.g., cat.#s 27367, 27369, 27351) onto the compression fitting mounted directly on the 1/4" canister tube stub of a Restek 1, 3, 6, or 15 L air canister, you must use a RAVEqc valve bracket (cat.# 27375). This secures the canister/valve assembly to the air canister's cage and prevents unwanted movement of the air canister within its cage.
 - o A RAVEqc valve bracket is not necessary if attaching directly to a Restek miniature air canister (e.g., cat.#s 24205, 24207), or another vendor's air canister.
 - o If installing a RAVEqc quick-connect air valve directly onto an air canister, we recommend that a male RAVEqc quick-connect air valve with a 1/4" compression fitting be used to connect directly to the welded 1/4" tube, compression nut, and ferrule set that is already attached to the air canister. While a female RAVEqc quick-connect air valve with a 1/4" compression fitting could be installed, it is common that labs have many more air canisters than components that the cans attach to (e.g., flow controllers, oven ports, etc.), so it is more economical to use the less expensive valve on the more abundant hardware.

Operation of RAVEqc Quick-Connect Air Valves



Connecting RAVEqc Quick-Connect Air Valves

1. Starting with a female RAVEqc quick-connect air valve, firmly grab, pull back, and hold in place the spring-loaded locking collar (1a–1b). The spring-loaded locking collar must be fully retracted for the male RAVEqc quick-connect air valve to be seated properly.
2. Insert and fully seat the male RAVEqc quick-connect air valve into the female RAVEqc quick-connect air valve (2a). There will be resistance as the internal springs within each part are pushed back, opening the flow path (2b). Insert the male RAVEqc quick-connect air valve as far as it will go to fully seat it. Once fully seated, release the spring-loaded locking collar on the female RAVEqc quick-connect air valve and let it spring back into its original position. If properly seated and locked into place, the male RAVEqc quick-connect air valve will not separate from the female valve.

Disconnecting RAVEqc Quick-Connect Air Valves

To disconnect male and female RAVEqc quick-connect air valves, simply retract the spring-loaded locking collar on the female valve end and separate the two parts. This will close the valves in both the male and female valve ends, blocking flow to or from the devices to which they are attached.

NOTE: RAVEqc quick-connect air valves have been designed to provide consistent, carefree connections. They are assembled to stringent specifications during manufacture and are therefore not intended to be serviced. To mitigate undesired loosening of the cap on the male valve end during regular use, 36 in-lb of torque is carefully applied to each male valve using a high-quality, 6-point, 6 mm socket during assembly.

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