

# #60-1267-020 Dual Air Valve for SyriXus® 500xv Installation Instructions

## Overview

The SyriXus 500xv dual air valve option is designed to automatically allow the SyriXus 500xv pumps to operate continuously under software control. As one pump is delivering working fluid, the other refills and balances pressure, then waits its turn to take over delivery. As the delivering pump reaches near empty, the software gradually switches delivery to the other (full) pump. Once the switch is completed, the first pump then refills and balances pressure, then waits its turn to take over delivery again.

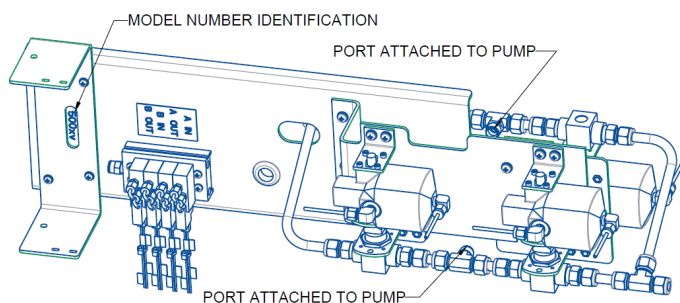
This operation allows the pumps to deliver working fluid continuously with nearly no deviation in the delivered pressure (or flow) while the pumps refill. This action will continue while working fluid is available to the refill the pumps or the until the user stops or changes the flow.

The dual air valve option mounts between two SyriXus 500xv pumps and fastens the two pumps together. The two pumps must both be 500xv models to allow proper operation.

## Parts of the Valve Assembly

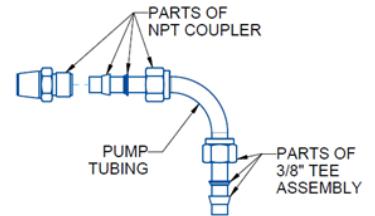
Most of the valve assembly will be assembled at the factory, but the pump tubing will be loosely attached to the valve package. Additionally, the reagent supply tubing and air supply tubing are shipped unattached to prevent damage to the plastic tubing during shipping. Screws and washers are supplied with the assembly in a separate package.

## Prepare the Valve Assembly for Installation

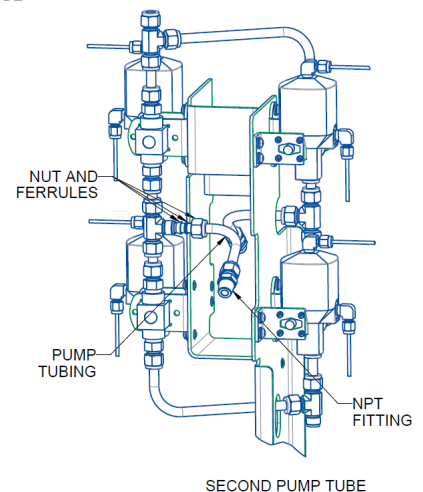
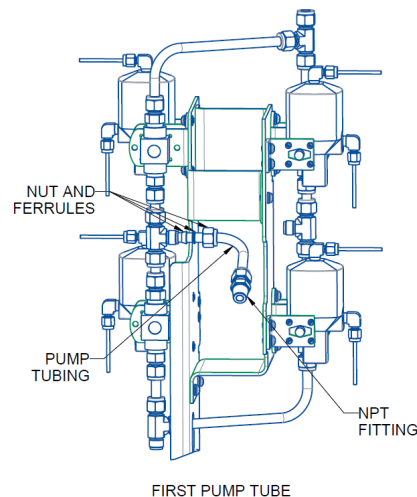


Remove the valve assembly from the packaging and identify the ports on the valves that will be attached to the tubing to the pump. These ports are on the tee connectors immediately between the valves, and the ports will be oriented toward the front and back of the valve assembly. Notice that there is lettering on the opposite end of the assembly relative to the valve identifying the model number.

Locate the Pump Tubing (2), the 3/8" NPT coupler (2) and the loose ferrules and gland nuts in the valve assembly packaging as shown in the figure to the right. These parts may be pre-assembled to the valve assembly at the factory or packaged separately. If not pre-installed, install the NPT Coupler to one end of the tubing. The tubing is symmetric. Observe that the two ferrules are oriented as shown in the figure.



Do not fully tighten the gland nut to the NPT fitting yet as it will be threaded into the pump cap later. It may be helpful to tighten the gland nut to partially swage the ferrules to the tube so that they remain in position, then loosen the gland nut so that the coupler can rotate on the tubing.



If the tubing was pre-assembled to the valve, make sure that that nut connecting the pump tube to the valve is loose enough that the tubing can rotate. It may be easier to remove the NPT adapter from the pump tubing and install it into the pump cylinder cap to facilitate aligning the tubing as the valve package is attached to the pump.

Orient the valve assembly with the assembly facing to the right as shown in the above figure as “First Pump Tube” and the model identifier lettering end downward. The end of the valve assembly with the Model Identifier Lettering represents the “bottom” of the valve assembly.

If the pump tubing was not attached at the factory, insert one of the pump tubing assemblies from the previous step into the tee with the NPT fitting oriented as shown. Use care to orient the two ferrules and gland nut as shown. Finger tighten the gland nut to keep the tubing in position. It may be helpful to tighten the gland nut to partially swage the ferrules to the tube so that they remain in position, then loosen the gland nut so that the tubing can rotate in the tee.

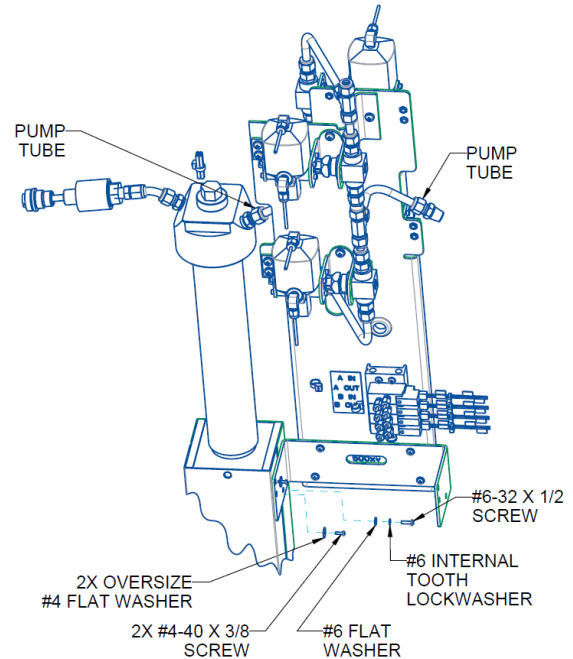
Turn the valve assembly facing to the left as shown in the above figure as “Second Pump Tube” and insert the other pump tubing assembly into the tee with the NPT fitting oriented as shown. Use care to orient the two ferrules and gland nut as shown. Finger tighten the gland nut to keep the tubing in position. As above, it may be helpful to partially swage the ferrules to the tubing.

Do not fully tighten these pump tube fittings as the tubing will need to be repositioned later.

**CAUTION: The next steps are a two-person operation, as the valve package weighs about 11 pounds [5 kg]. Installing the screws while supporting the valve weight with one hand is not recommended.**

Insert two #6-32 x 1/2 screws into #6 internal tooth lock washers, then insert the #6-32 x 1/2 screws with lock washer into a #6 flat washer. Next, insert four #4 40 x 3/8 screws each into an oversized #4 flat washer. Place these screws and washers within convenient reach near the pump.

Position the valve assembly on the side of one of the pumps with the pump tube aligned with the port in the cap. While holding the valve in place, thread the NPT fitting into the pump cylinder cap. Tighten the NPT fitting into the pump cap finger tight.

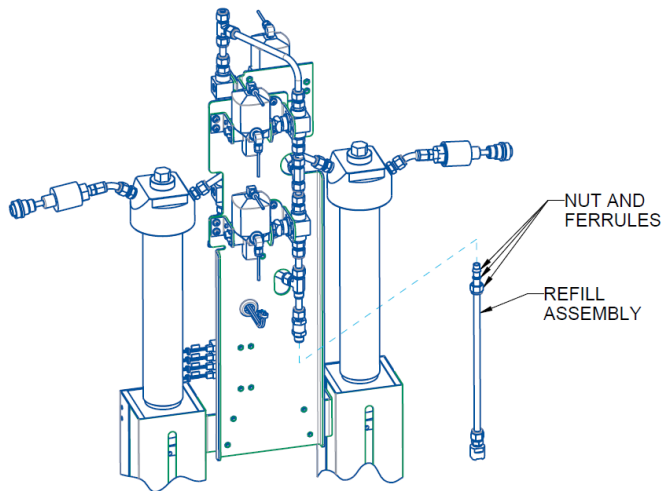


Continuing to hold the valve assembly in place, insert the #6 screw with washers into the valve mounting bracket in the bottom hole closest to the valve as shown in the figure. Tighten this screw only finger tight. Install the two #4-40 screws in the top two holes in the mounting bracket near the front of the pump as shown. Tighten these screws finger tight.

Move the second pump into position so that the free pump tubing aligns with the port in the second pump's cap. Thread the NPT fitting into the second pump cylinder cap. Tighten the NPT fitting into the pump cap finger tight.

Install the remaining #6-32 screw with washers and #4-40 screws with washers into the mounting bracket and into the second pump in the same manner as was done with the other pump.

Adjust the position of the valve assembly and then tighten the six screws just installed. Tighten the NPT fittings into the cylinder caps about 1 1/2 turns beyond finger tight. Do not overtighten. Tighten the gland nut on the coupler and valve tees using standard Swagelok® specifications. Hold the NPT fitting with a wrench while tightening the gland nut to avoid damage.



Locate the refill tubing assembly. The gland nut and ferrule to attach the refill assembly to the valve may already be swaged onto the refill assembly.

Thread the nut and ferrule into the bottom of the tee connected to the lower crossover tube and tighten using standard Swagelok specifications. While tightening, use a wrench on the flats of the tee to prevent damaging the assembly while tightening the gland nut.

**NOTE: The refill tubing can be shortened by removing the fitting and ferrule at the filter end and cutting the tubing shorter.**

Remove the shipping tape around the filter, adjust length (if desired) and tighten the fitting to no more than 20 in-lbs [2.3 N·m].

Air supply tubing is provided with the valve assembly. Connect the air supply tubing to the actuator by pushing the retaining ring on the actuator port inward and then pushing the tubing into the actuator. Release the retaining ring. When properly installed, the tubing should not be able to be easily pulled out. Reversing this procedure allows the air supply tubing to be detached should the pumps need to be moved.

The pump and valve can now be electrically connected to the controller as described in the user's manual.

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