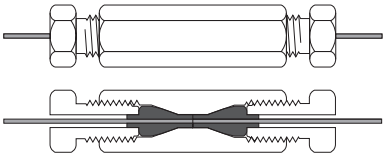
VICI Valco Instruments Co. Inc.

Fused Silica Adapters

Valco fused silica adapters permit easy use of open tubular columns with Valco valves, and provide direct connection of fused silica within Valco fittings for maximum bore uniformity and inertness. Because they are machined from a special high density polyimide alloy, Valco fused silica adapters can be used at sustained high temperatures (350° C) without the plastic distortion and shrinkage typical of conventional direct formed ferrules.

The one-piece FS adapter is recommended for use in fittings where the polyimide ferrule will not be routinely removed. The FSR adapter with removable liner is recommended for use in valve fitting details.

One-piece Fused Silica Adapters



Product Numbers:

FS.25, **FS.4**, **FS.5**, **FS1.5**, **FS1.8**

CAUTION:

Do not attempt to use this type of fused silica adapter in valve fitting details. Refer to the section on fused silica adapters with removable liners, which are designed for use with valves.

Valco one-piece adapters differ from standard ferrules by the addition of special "nibs" on either end. The nib on the back of the ferrule prevents misalignment and cold flow problems. The front nib fills the pilot volume, eliminating dead volume and insuring alignment with the other tubing or with the through bore of the union.

FS Installation Instructions

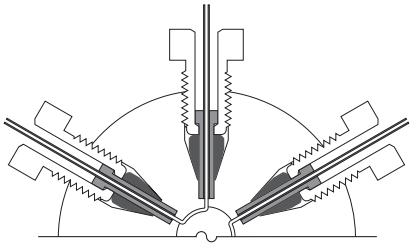
1. Slide the nut over the fused silica tube, hex end first.
2. Slide the adapter over the tube, large end first.
3. Cut off a small amount of the fused silica tube to expose a fresh end and to minimize the risk of contaminating the tube with particles scraped from the inside of the adapter.
4. Pull the tube back until its end is flush with the end of the adapter.
5. Screw the nut into the fitting, using a wrench to tighten the nut 10-15° past finger-tight. (For customer convenience, Valco sells a 3/16" x 1/4" open-end wrench, Product Number OEW,that fits both 1/16" and 1/32" fittings.)
6. Leak check with H_2 and a hydrogen leak detector, or with H_2 or helium using a thermal conductivity type leak detector. If a small leak is observed, an additional 10-15° should produce a tight seal.

To disconnected the fitting, simply loosen the 1/32" or 1/16" fitting nut and slide the tube out.

Should a tube break in a straight-through union, remove both nuts and the tube opposite the broken one. Clear the fitting by inserting an appropriately sized drill or wire from the unbroken side.

A small drill in a pin vise is a useful tool for removing ferrules from tee and cross fittings. The appropriate drill can also be used to enlarge the interior diameter of an FS adapter.

Fused Silica Adapters - Removable Liner



Product Numbers

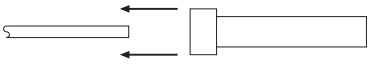
FSR.25, **FSR.4**, **FSR.5**, **FS1R.2**, **FS1R.5**, **FS1R.8**

The FSR adapter consists of three components: a polyimide ferrule, a special counterbored nut, and a polyimide liner which slides over the fused silica tubing. The liner is stepped at one end so that it is retained by the nut, insuring that the liner and the tube within are removed as the nut is unscrewed from the valve.

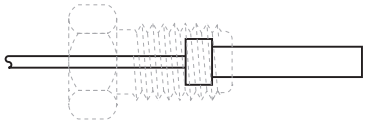
An installation tool is also supplied. The tool, which consists essentially of a “cutaway” length of 1/16" TFE tubing, provides a means of pushing the liner to the bottom of the nut and keeping it there against the frictional forces generated in Steps 4 and 5.

FSR Installation Instructions

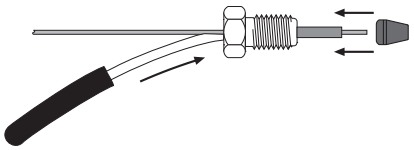
1. Slide the liner over the tube, large end first.



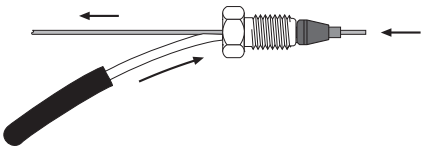
2. Cut off a small amount of the fused silica tube to expose a fresh end and to minimize the risk of contaminating the tube with particles scraped from the inside of the liner.



3. Slide the small end of the liner into the nut, making sure that the “step” of the liner goes all the way to the bottom of the counterbore in the nut.



4. Slide the ferrule over the liner, using the installation tool to keep the liner all the way into the nut.



5. While continuing to hold the liner in place with the tool, pull the fused silica tube back until its end is flush with the liner.

6. The tube and liner as a unit must be continuously pushed in while the nut is screwed into the fitting detail. While using one hand to hold the tube against the tool so that the tube is supported while it’s being pushed, screw in the nut with the other until it is fingertight.

7. Use a wrench to tighten the nut in 15° increments until you can tell the ferrule is starting to grip the column, then tighten it an additional 15°. (The fitting may need to be retightened after the first time it is heated above 250°C.)

   For customer convenience, Valco sells a 3/16" x 1/4" open-end wrench, Product Number OEW, that fits both 1/16" and 1/32" fittings.

8. Leak check with H_2 and a hydrogen leak detector, or with H_2 or helium using a thermal conductivity type leak detector. If a small leak is observed, an additional 10-15° should produce a tight seal.

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