



Agilent G3182-61580, G3182-61581, and G3187-64000 Union Kits

Installation Guide

Parts Supplied

Table 1 Ultimate union kit, deactivated G3182-61580

Description	Quantity
Union, deactivated	1
Oven wall clip for CPM union	1
Standoff bracket for CFT unions	1
Retaining clip for CFT union bracket	1
Internal nut for CFT capillary fitting	2
Screw, T-20, M4 x 8 mm	1

Table 2 Ultimate union kit, non-deactivated G3182-61581

Description	Quantity
Union, non-deactivated	1
Oven wall clip for CPM union	1
Standoff bracket for CFT unions	1
Retaining clip for CFT union bracket	1
Internal nut for CFT capillary fitting	2
Screw, T-20, M4 x 8 mm	1



Table 3 Union-on-plate kit G3187-64000

Description	Quantity
Union-on-plate, inert	1
Internal nut, CFT capillary fitting	2
Oven wall bracket for CFT plate devices with thumbscrew	1
SilTite ferrule, 0.4-mm id, 5/pk	1
Ferrule pre-swaging tool	1
Plug for microfluidic manifold or unions	2
Agilent Technologies GC and GC/MS Hardware User Information and Instrument Utilities DVDs	1

Parts Not Supplied

Table 4 Available SilTite metal ferrule packages

Part number	SilTite ferrule description
5188-5361	For 0.2- to 0.25-mm columns
5188-5362	For 0.32-mm columns
5188-5363	For 0.53-mm columns

Tools Required

- 1/4-inch open-end wrench
- Column cutting tool
- Ferrule pre-swaging tool
- Screwdriver

Parts Identification

The Agilent Union kits provide high performance, easy-to-maintain connections for capillary columns. A union connects two capillary columns such as a guard or retention gap and an analytical column.

The three union kits available are:

- The G3182-61580 kit contains a deactivated union. It is for use with columns and other areas that the sample passes through.
- The G3182-61581 kit contains a non-deactivated union. It is appropriate for gas supply lines or situations where metal activity is not a factor.
- The G3187-64000 kit contains a deactivated union plate with two fittings, which both point inward toward the column basket. This limits the strain on the columns. Because of this, the union-on-plate can work with columns sensitive to strain, such as 530 columns and columns at high temperatures.



Figure 1 Parts in Ultimate Union kits G3182-61580 and G3182-61581

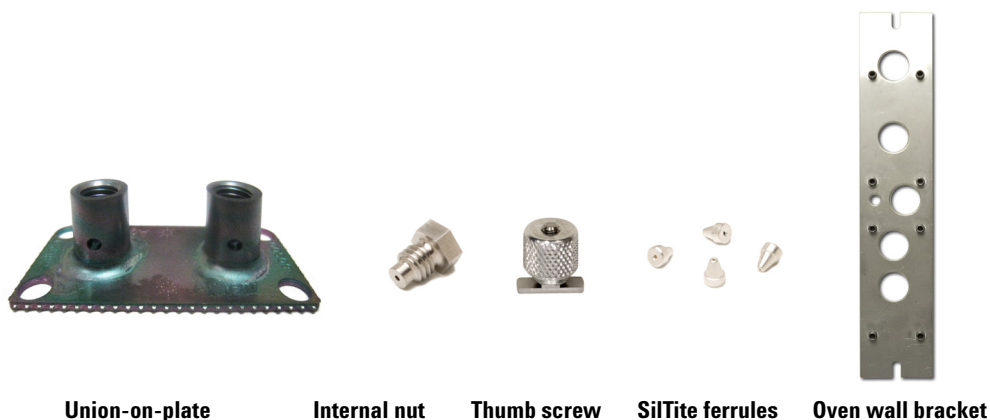


Figure 2 Parts in Union-on-plate kit G3187-64000

Safety

Many areas and parts of the GC operate at temperatures high enough to cause serious burns. These include, but are not limited to components inside the oven, and components connected to the oven such as:

- The inlet
- The detectors
- Any nut attaching a column to an inlet, to a detector, or to a union
- The oven wall clip

Cool these areas to room temperature before working on or around them.

The inlet and detector cool faster if you set their temperatures to **OFF** and set oven temperature to room temperature (which keeps the oven fan and exhaust flaps in operation). Turn the oven off when room temperature is attained.

Be careful when working behind the instrument. During oven cooldown, the GC emits hot air exhaust which can cause burns.

Once cool, all pressure zones should be set to **OFF**. Caution should be exercised when venting residual pressure that may still be present.

WARNING

The surface of and parts inside the GC oven may be hot enough to cause burns. Wait for the parts to cool.

WARNING

Hydrogen gas is flammable and potentially explosive when accumulated inside the oven. For this reason, Hydrogen should not be used as carrier gas with this product due to possibility of tube breakage.

Installing the CFT unions

Ultimate unions

There are two ways to install the ultimate unions: using the standoff bracket or the oven wall clip.

To use the standoff bracket to support the weight of the union, attach the bracket to the oven wall with the M4x8 mm screw as shown in [Figure 3](#)

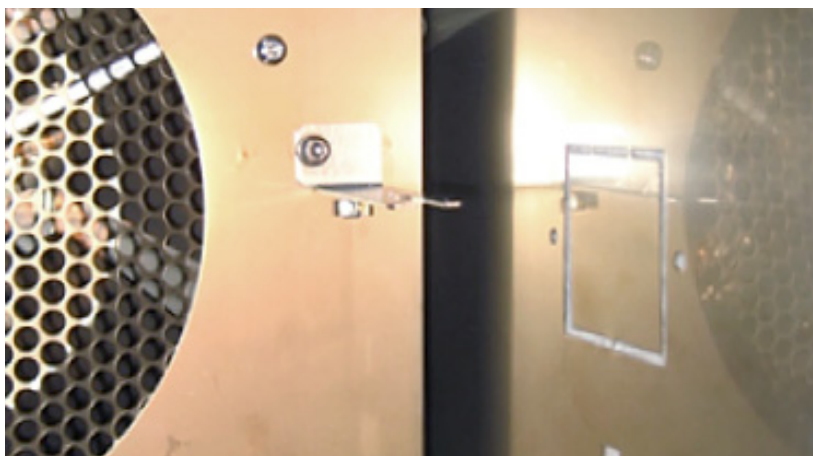


Figure 3 Standoff bracket for CFT unions

To use the oven wall clip to support the weight of the union, attach the oven wall clip to an opening in the oven wall, as shown in [Figure 4](#).

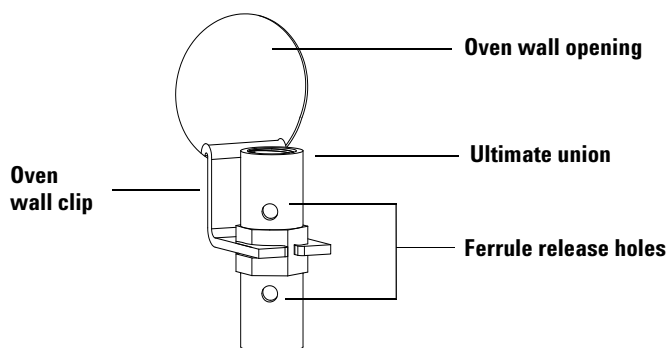


Figure 4 Oven wall clip and ultimate union

Union-on-plate

The oven wall bracket can accommodate several CFT devices. It can be installed in four positions (left, right, front, back).

- 1 Place the bracket against the side of the oven with the notch facing up and the standoffs facing the center of the oven.
- 2 Use the thumbscrew to fasten the bracket to the T-slot in the oven wall (Figure 5). Pull the thumb screw sleeve back to facilitate slipping it into the slot on the oven wall.

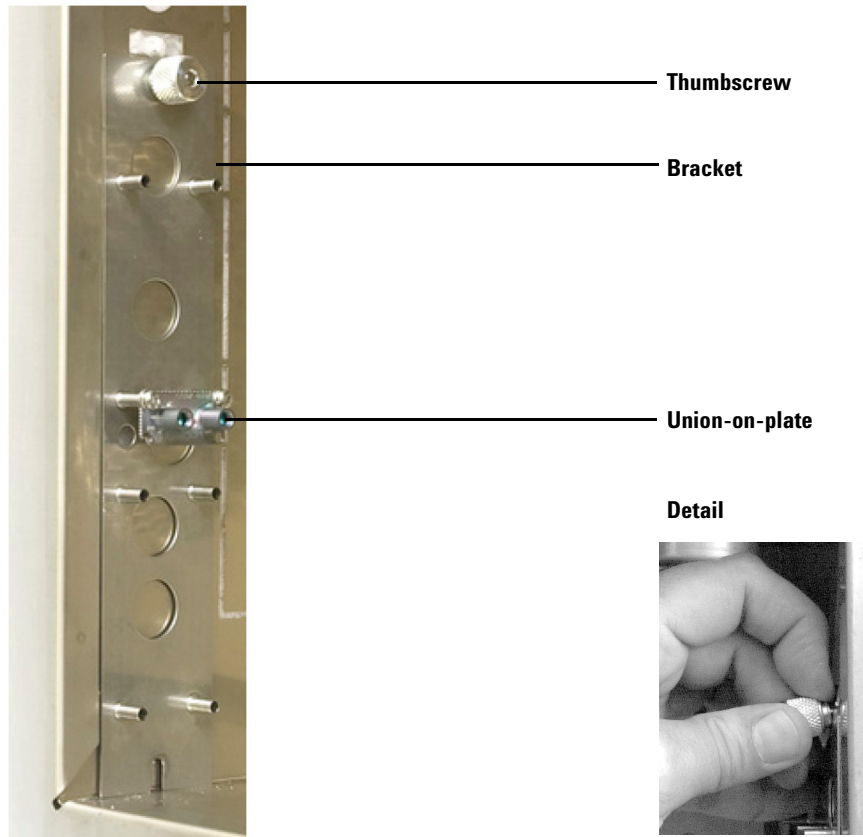


Figure 5 Installing the wall bracket and union-on-plate

- 3 Tighten the thumb screw and push down on the plate to keep it firmly seated against the bottom of the oven. Be sure that the “T” behind the thumbscrew is horizontal.
- 4 Attach the union-on-plate to the oven wall bracket with 2 screws. The fittings must point towards the column basket as in Figure 5.

Preparing the column ends

Materials are available to make connections to 0.1- to 0.25-mm, 0.32-mm, and 0.53-mm id columns and tubing.

- 1 Obtain the appropriate metal ferrule (not included) from those listed in [Table 4](#).
- 2 Pass the tubing end through the internal nut and SilTite ferrule leaving approximately 1 cm of fused silica tubing protruding beyond the ferrule. Thread the ferrule pre-swaging tool onto the internal nut with the tube protruding (see [Figure 6](#)).



Figure 6 Thread the internal nut, ferrule, and ferrule pre-swaging tool

CAUTION

The SilTite ferrules are delicate. Follow the instructions in the next step very carefully to avoid overtightening.

- 3 Using the wrench and ferrule pre-swaging tool, tighten the nut a little at a time, occasionally checking to see if the ferrule is gripping the tube (see [Figure 7](#)). When the ferrule just starts to grip, notice position of the nut and then tighten by turning 45 to 60 degrees of rotation, but no more than 60 degrees (one flat). If you can pull the column free, it is not tight enough.

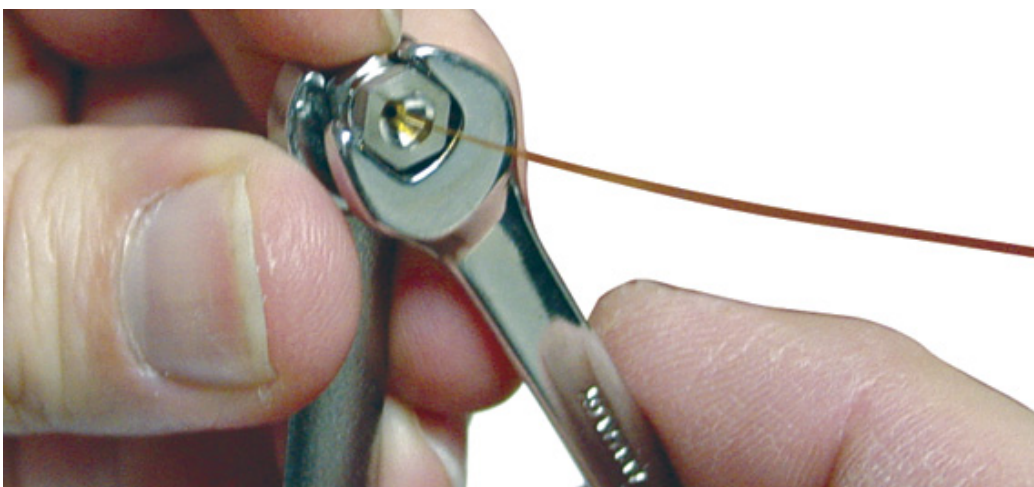


Figure 7 Tightening the internal nut

- 4 Remove the swaging tool ([Figure 8](#)).

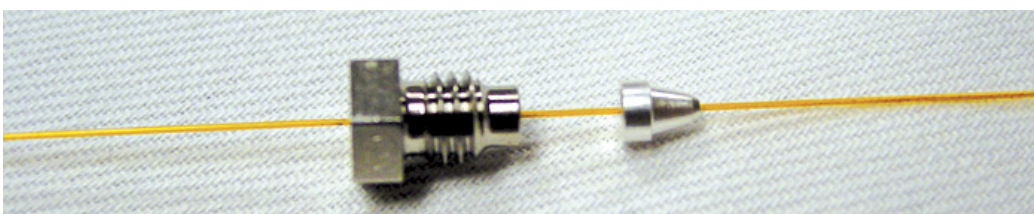


Figure 8 Removed ferrule pre-swaging tool

- 5 Using a ceramic column cutter, trim the tubing at the small end of the ferrule leaving approximately 0.3 mm of tubing extending beyond the ferrule ([Figure 9](#)).

It is important that the ceramic column cutter have one side dedicated to only make contact with the column and the other side dedicated to riding on the edge of the metallic SilTite ferrule. This preserves the ceramic edge sharpness which is necessary to making good column cuts.

NOTE

It is important that the tube end does not extend beyond 0.5 mm from the end of the ferrule.

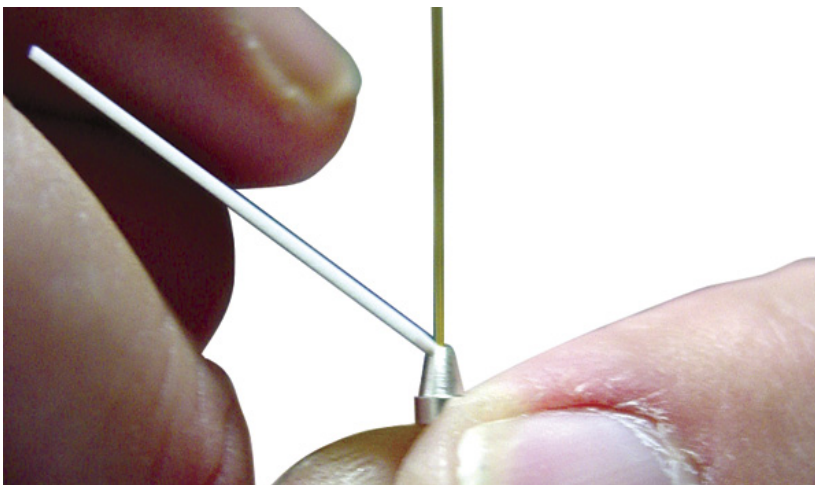


Figure 9 Ceramic column cutter and ferrule

- 6 Check the end of the tube with a magnifier. The end of the tube need not be perfectly square, but should not have cracks which extend under the ferrule. [Figure 10](#) shows a completed tube end.

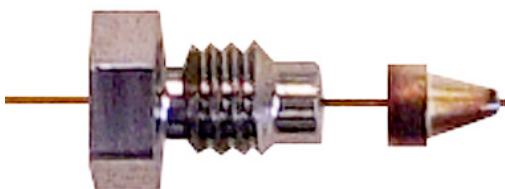


Figure 10 Tube end with internal nut and swaged SiTite ferrule

Connecting Columns

Connect columns to the Ultimate union or Union-on-plate with internal nuts and preswaged SilTite ferrules ([Figure 11](#)). Finger-tighten the nuts. Further tighten with a wrench only 15 to 20 degrees.



Figure 11 Completed Ultimate union with columns

Disconnecting columns

Loosen and remove the internal nut. If the column and ferrule do not come free, insert a pointed object (pen, paper clip) into the ferrule release hole and press firmly. You will hear a click as the ferrule releases.



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