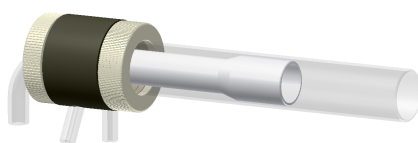


# D-Torch\* Installation guide

## Vista Axial / 700-ES Axial Series

### 30-808-2919



#### BEFORE YOU START

Congratulations on the purchase of your D-Torch.

The D-Torch is supplied fully assembled. This document will explain how to dismantle the D-Torch and replace components. Table 1 lists details for each D-Torch component, they can be ordered separately from D-Torch supplier.

Item No.	Part Number	Description	Qty
1	31-808-2921	D-Torch injector retainer	1
2	Refer Note	D-Torch injector	Refer Note
3	31-808-2918	D-Torch body	1
4	31-808-2685	D-Torch quartz outer tube	1
5	31-808-2818	Outer tube retainer	1
6	SAFEGLOVE-MED	Safety gloves	1
7	GAZ-06	GazFit Connectors 6mm (Four per pack)	Refer Note

Table 1

#### Note:

Item 2. D-torch injector not supplied with standard D-torch assembly (shown for reference only). There is a range of different injectors suitable for this D-Torch – These can be purchased from your D-Torch supplier

Item 7. Use GazFit connectors to attach ICP tubes to the D-torch side arms. Four connectors are supplied (two spare).



#### SCOPE

This document will explain how to: -

1. Install D-Torch
2. Remove D-Torch outer tube.
3. Attach D-Torch outer tube.
4. Access D-Torch injector.

Appendix A: Ceramic outer tube (option for this D-torch)

\* The D-Torch is covered by US Patent 7,847,210 B2

# D-Torch\* Installation guide

## Vista Axial / 700-ES Axial Series

30-808-2919

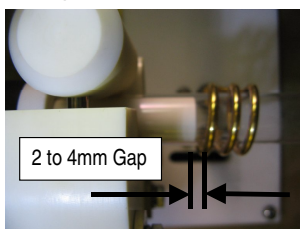
### GENERAL SAFETY

- Always wear safety gloves (item 6) and safety glasses when handling ICP torches.
- It is recommended you read and understand this procedure before starting.
- The person performing this work must be competent in making basic ICP connections
- The ICP torch is made from high grade engineered materials – Handle with extreme care

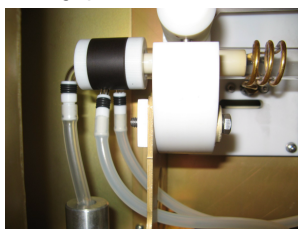
### 1. INSTALL D-TORCH

To install the D-Torch in your ICP, complete the following steps: -

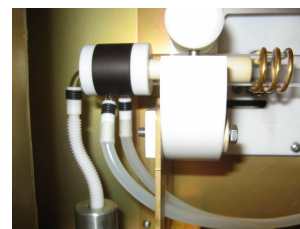
- 1.1 Remove existing ICP Torch and store away in a safe location.
- 1.2 Clamp D-Torch in ICP mounting block – Check gap between inner and ICP RF coil is 2 ~ 4mm.



Step 1.2



Step 1.3a (Tygon transfer tube)



Step 1.3b (PuraFlex transfer tube)

- 1.3 Fit D-Torch in mounting block and connect gas tubes as normal - Note! There are **two Transfer options**;  
**a. Flexible (Tygon) tube:** Use existing tube as normal.

- b. Agilent semi-rigid Tube:** The D-Torch is longer than the traditional ICP torch, You may need to replace your semi-rigid tube with;
- 21-100-0215 Spray chamber mounting bracket  
21-809-3707 PuraFlex tube with bend



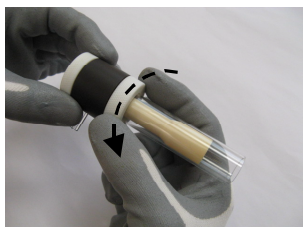
Puraflex tube & spray chamber bracket

Once you are satisfied with the D-Torch position and gas line connections, the **D-Torch is ready for use.**

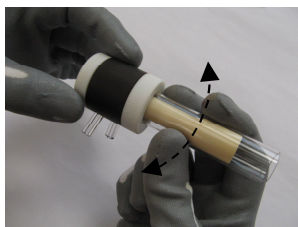
### 2. REMOVE D-TORCH OUTER TUBE

The D-Torch's outer tube is accurately located in the D-Torch body with a retainer cap. The outer tube can be removed at any time by completing the following steps.

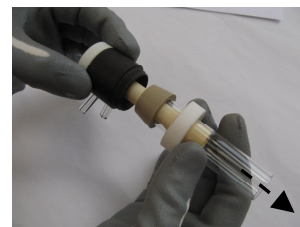
- 2.1 If fitted, remove D-Torch assembly from ICP (not shown).
- 2.2 Unscrew retainer ½ turn
- 2.3 Grip outer tube (lower end, near D-Torch body) then gently wriggle the tube from side to side - refer figure 2.3. You will hear a “click” as the outer tube releases.
- 2.4 Fully unscrew the retainer then carefully withdraw the outer tube from the D-Torch body



Step 2.2



Step 2.3.



Step 2.4.

**Note!** D-Torch outer tube is permanently fitted with a taper ferrule - **Do not** attempt to remove ferrule from outer tube. Alumina inner tube is permanently fixed to D-Torch body - **Do not** attempt to remove inner tube from the D-Torch.

# D-Torch\* Installation guide

## Vista Axial / 700-ES Axial Series

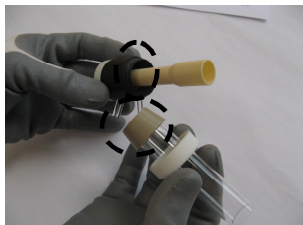
30-808-2919

### 3. ATTACH D-TORCH OUTER TUBE

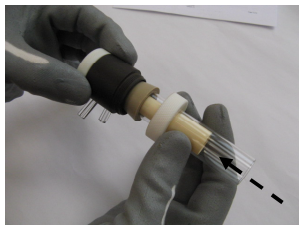
To fit the D-Torch outer tube to D-Torch body, complete the following steps.

- 3.1 Check that both locating surfaces (outer tube and torch body) are clean and free from damage.
- 3.2 Carefully slide the outer tube over the inner tube – the outer tube will self locate into the torch body.
- 3.3 Tighten the retainer to fix the outer tube in place.

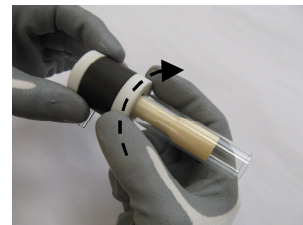
**Note!** Do not over tighten retainer - Only medium force by hand is necessary.



Step 3.1.



Step 3.2.



Step 3.3.

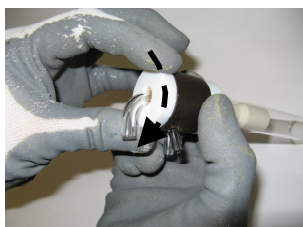
- 3.4 If required, return torch assembly to ICP and connect as normal (not shown).

### 4. ACCESS THE D-TORCH INJECTOR

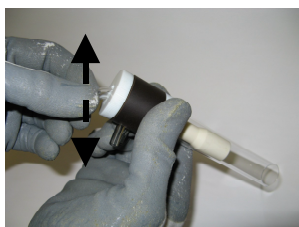
To access D-Torch injector, complete the following steps.

#### To remove the injector

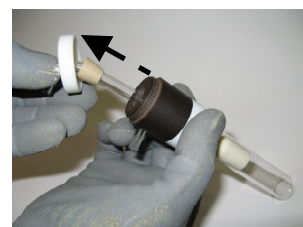
- 4.1 Unscrew the injector retainer ½ turn
- 4.2 Grip injector and gently wriggle it from side to side - You will hear a “click” as the injector releases.
- 4.3 Fully unscrew injector retainer from D-Torch body - Injector is now loose in D-Torch body.



Step 4.1



Step 4.2



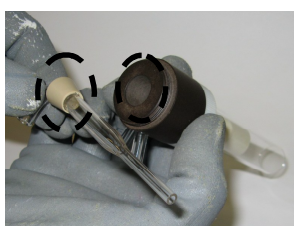
Step 4.3

- 4.4 Pull out injector from D-Torch body - **Check** condition of the injector. Replace if damaged or deteriorated.

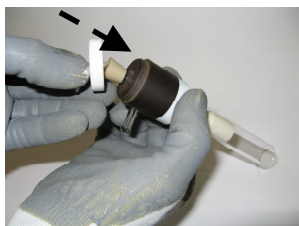
**Note!** A tapered ferrule is permanently fixed to the injector – **Do not** attempt to remove the ferrule from the injector.

#### To reinstall the injector

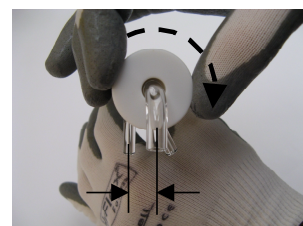
- 4.5 Check that both locating surfaces are clean and free from damage
- 4.6 Slide injector into D-torch body.  
**Hint** The next step will be easier if the injector retainer is partially in place (behind the injector ferrule) – fig 4.6
- 4.7 Screw injector retainer to D-torch body.  
**Before** fully tightening retainer, position injector elbow inline with D-Torch sidearms - fig 4.7  
**Do not** over tighten injector retainer - Only medium force by hand is necessary.



Step 4.5



Step 4.6



Step 4.7

# D-Torch ceramic outer tube Installation guide

Vista Axial / 700-ES Axial series

31-808-3027



## Appendix A

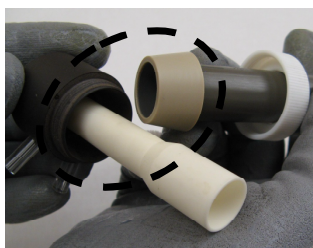
### Ceramic outer tube (option for this D-torch)

If desired, it is possible to operate your D-Torch with a durable ceramic outer - This can be purchased from your D-Torch supplier, part number: 31-808-3027.

### ATTACH D-TORCH OUTER TUBE

As the Ceramic outer tube is non-transparent, there will be less light emission around the ICP torch box. Your ICP is fitted with an interlocking light sensor that detects plasma activation. Some experimentation may be needed to determine the optimal rotational position of the ceramic outer tube - Please complete the following steps: -

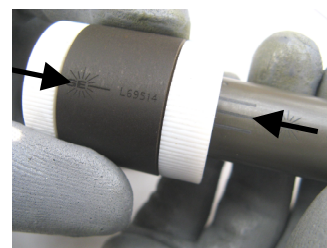
- A.1 If fitted, remove D-Torch from your ICP then disconnect outer tube from the D-Torch.  
This procedure and other general instructions are explained in D-Torch installation guide INS-0125.
- A.2 **Check** both locating surfaces (outer tube and torch body) are clean and free from damage.
- A.3 Carefully slide the outer tube over the inner tube – the outer tube will self locate into the D-Torch body.
- A.4 First try aligning the middle stripe of the outer tube with D-Torch body serial number.



Step A.2



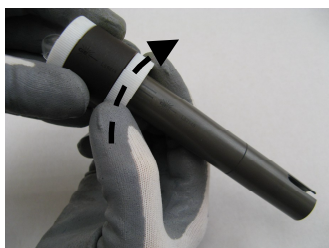
Step A.3



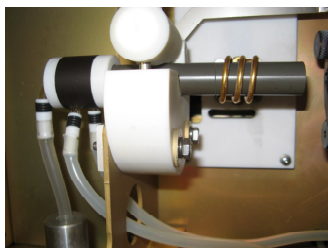
Step A.4

- A.5 Tighten the retainer to fix the outer tube in place (moderate pressure by hand is adequate).
- A.6 Fit the D-Torch to ICP torch box as normal (with forward gas arm vertically down) and commence ignition sequence.

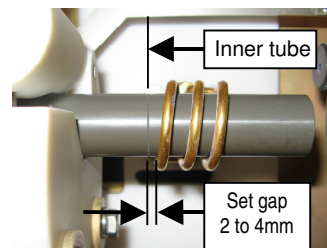
**Note!** To assist with D-Torch positioning, a band is marked on the ceramic outer tube – This indicates position of D-Torch's inner tube. Typically, this gap is set to 2 ~ 4mm.



Step A.5



Step A.6a



Step A.6b

If the **D-Torch fails to light**, return to step 2.4 and try alignment with an alternative outer tube stripe – Repeat this step until plasma ignites.

**Note!** If you have any questions regarding the D-Torch ceramic outer tube or this procedure, contact your D-Torch supplier.