

D-Torch* for Spectro EOP

Part Number 30-808-3371



BEFORE YOU START

Congratulations on the purchase of your D-Torch.

As supplied, the D-Torch is fully assembled. Table 1, lists the D-Torch parts that can be ordered separately.

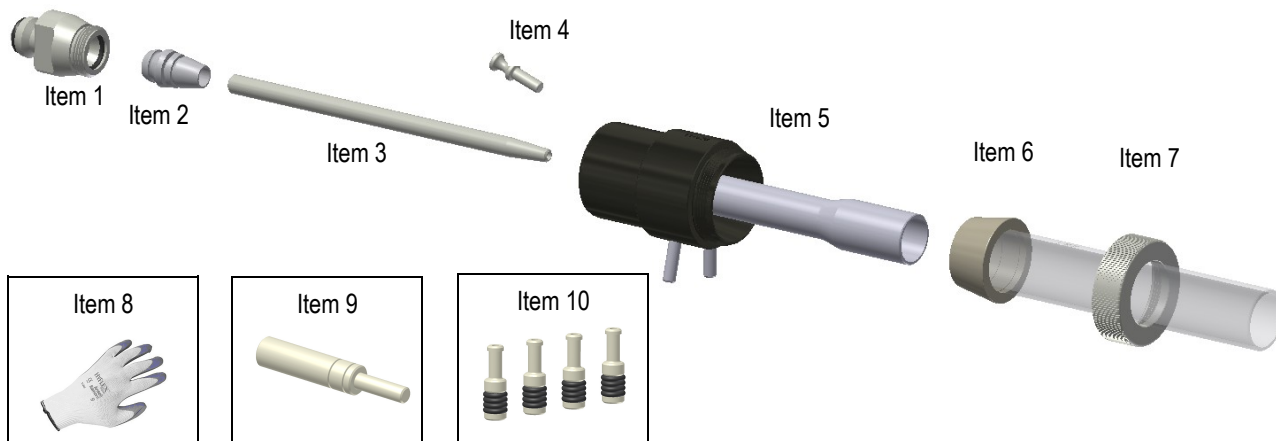
Item No.	Part Number	Description	Qty
1	31-808-3374	D-Torch injector adaptor - B13	1
2	31-808-2962	D-Torch injector ferrule	1
3	Refer note	Injector	Refer Note
4	31-808-3426	D-Torch Plug	1
5	31-808-3372	D-Torch body	1
6	31-808-3142	D-Torch quartz outer tube	1
7	31-808-2818	Retainer	1
8	SAFEGLOVE-MED	Safety gloves	1
9	70-803-0920	D-Torch injector ferrule tool	1
10	GAZ-04	GazFit connectors 4mm	Refer Note

Table 1

Note!

Item 3. D-torch injector not supplied with standard D-torch assembly (Shown for reference only). There is a range of different injectors suitable for Spectro D-Torch – These can be purchased from your D-Torch supplier

Item 10. 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. General safety
2. Remove D-torch outer tube
3. Attach D-Torch outer tube.
4. Access D-Torch injector.
5. Replace injector ferrule.

* The D-Torch is covered by US Patent 8,232,500 B2

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1. GENERAL SAFETY

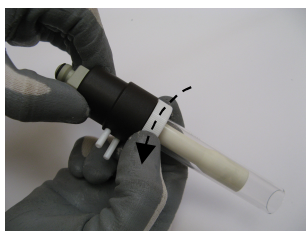
- Always wear safety gloves (item 8) and safety glasses when handling ICP torches.
- It is recommended you read and understand this procedure before starting.
- The person performing this work must be competent in making basic ICP connections.
- The ICP torches are made from high grade engineered materials – handle all torches with extreme care.
- Do not allow the D-Torch to be placed on hard surfaces or allow it to come into contact with hard objects.

2. REMOVAL OF D-TORCH OUTER TUBE

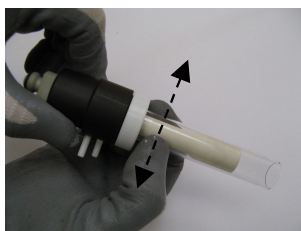
The D-Torch outer tube is accurately retained in the D-Torch body.

The outer tube can be removed at any time by completing the following steps.

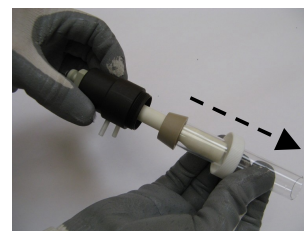
- 2.1 If fitted, remove D-Torch assembly from ICP (not shown).
- 2.2 Unscrew retainer ½ turn.
- 2.3 Grip outer tube (lower end, near D-Torch body) then gently wriggle the tube from side to side.
Note! You will hear a “click” as the outer tube releases from the D-Torch body.
- 2.4 Fully unscrew the retainer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

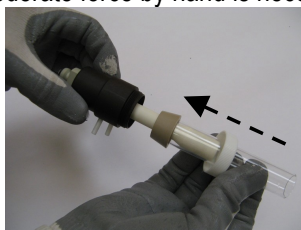
3. ATTACH D-TORCH OUTER TUBE

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

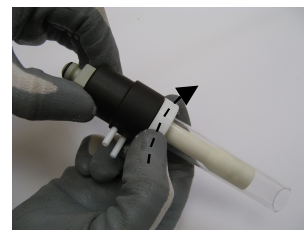
- 3.1 Check that both locating surfaces (D-Torch body and outer tube) are clean and free from damage.
- 3.2 Carefully guide the D-Torch outer tube over the inner tube – the outer tube will self locate into the torch body.
- 3.3 Tighten the retainer to fix the outer tube in place.
Do not 'over-tighten' the retainer - only moderate force by hand is necessary.



Step 3.1



Step 3.2



Step 3.3

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

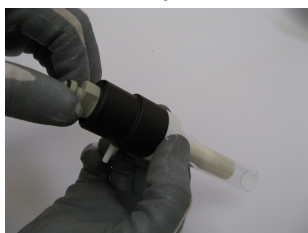
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4. ACCESS D-TORCH INJECTOR

To remove the injector

- 4.1 Unscrew the injector adaptor from the rear of the D-Torch and carefully remove the adaptor from D-Torch body.



Step 4.1a



Step 4.1b



Step 4.1c

- 4.2 Slide the injector out from the injector adaptor

Check condition of the ferrule – Replace ferrule if damaged or deteriorated (refer section 5).



Step 4.2a



Step 4.2b

To reinstall Injector to the D-Torch

Repeat steps 4.1 and 4.2 in reverse order.

Note! Push injector all the way into the injector ferrule. (End of injector must butt-up against inside of adaptor).

5. REPLACE INJECTOR FERRULE

To replace the injector ferrule, complete the following steps: -

- 5.1 Insert the injector ferrule tool (item 9) into the injector ferrule then pivot tool sideways to unseat the ferrule from the injector adaptor - Discard ferrule.

You may need to apply a moderately high amount of force to un-seat the injector ferrule from the adaptor.



Step 5.1a



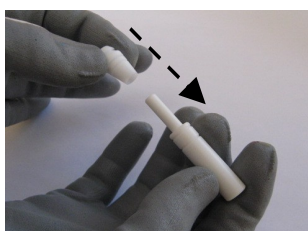
Step 5.1b



Step 5.1c

- 5.2 Place a new injector ferrule (item 2) onto the stem of injector ferrule tool. Position the ferrule into the adaptor and push together until you feel the ferrule 'seat' with adaptor o-ring. When done, withdraw injector ferrule tool.

Tip! It helps if you pivot (like step 5.1b) the injector ferrule tool whilst pushing-in the injector ferrule.



Step 5.2a



Step 5.2b



Step 5.2c

Finished! If you have any questions regarding the D-Torch assembly or this procedure, please contact your supplier.

Installation guide

D-Torch ceramic outer tube - Spectro EOP

31-808-3250

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 tube.

This can be purchased from your D-Torch supplier.

Item No.	Part Number	Description	Qty
A	31-808-3250	D-Torch ceramic outer tube	1
B	31-808-3380	Fibre optic assembly - 150mm	1

Item A



Item b



Note

Inside the ICP torch box, there is an optical sensor that detects light and signals when the plasma is active; The non-transparent nature of the ceramic outer tube prevents sufficient light reaching this torch box optical sensor. To overcome this problem, an optic fibre is supplied to convey light from the D-Torch to the ICP sensor.

PREPARE D-TORCH CERAMIC OUTER TUBE

A.1 If fitted, disconnect the D-Torch from your ICP.

Then, replace the D-Torch quartz outer tube with the ceramic type (item A).

Note! This step and other general D-Torch instructions, are explained in the preceding pages of this document.

A.2 Remove plug from rear of D-Torch body.

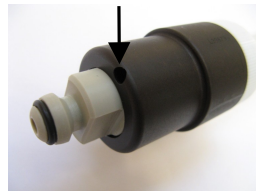
A.3 Insert protruding-end of the optic fibre lead (item B) into the rear of D-Torch body.



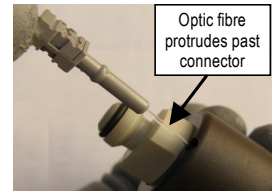
Step A.1a (Quartz tube)



Step A.1b (ceramic tube)



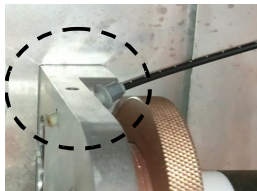
Step A.2



Step A.3

A.4 Fit the D-Torch into your ICP torch box as normal.

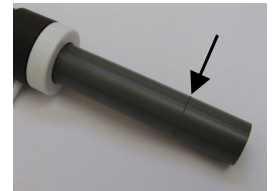
A.5 Remove the optical sensor from the ICP torch mount and connect this to the D-Torch optic light sensor tube.



Step A.5a



Step A.5b



Indication line - Refer note

Note! To assist with D-Torch positioning, a band is marked on the ceramic outer tube – This indicates position of the D-Torch's inner tube. Typically, the torch is set with a gap of 2 ~ 4mm between the torch's inner tube & ICP RF coil.

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