

Installation guide

D-Torch* for iCAP 6000 Duo

30-808-2844 (Quartz outer tube) & 30-808-2862 (Ceramic outer tube)

BEFORE YOU START

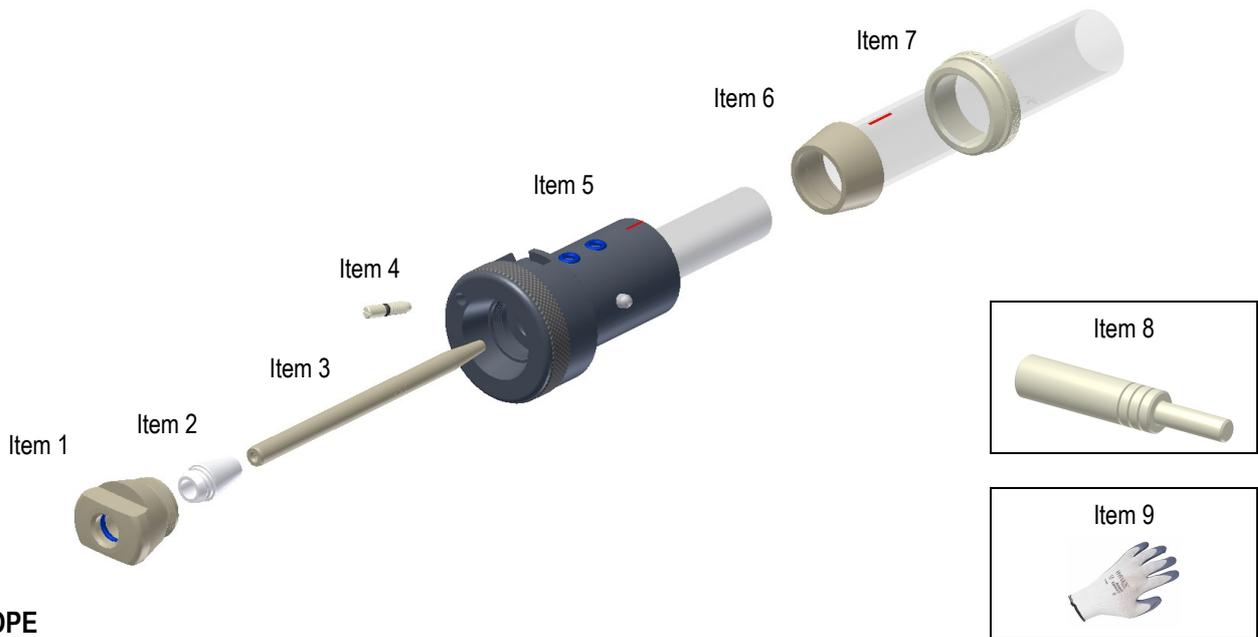
Congratulations on the purchase of your D-Torch.

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	31-808-2895	D-TORCH iCAP 6000 INJECTOR ADAPTOR	1
2	31-808-2897	D-TORCH iCAP 6000 INJECTOR FERRULE	1
3	Refer Note	D-TORCH iCAP 6000 INJECTOR	Refer note
4	31-808-3083	D-TORCH iCAP 6000 PLUG	1
5	31-808-2932	D-TORCH iCAP 6000 BODY	1
6	31-808-2840	D-TORCH iCAP 6000 DUO QUARTZ OUTER TUBE	1
7	31-808-2707	RETAINER	1
8	70-803-0915	INJECTOR FERRULE TOOL	1
9	SAFEGLOVE-MED	SAFETY GLOVES	1

Table 1

Note! D-Torch injector (item 3) is not supplied with standard D-Torch assembly (shown for reference only.)
A range of injectors suitable for the iCAP D-Torch can be purchased from Glass Expansion.



SCOPE

This document will explain: -

1. General safety
2. Removal of D-Torch outer tube
3. Attach D-Torch outer tube
4. Access D-Torch injector
5. Replacement of injector ferrule

Appendix A Ceramic outer tube (option for standard D-Torch)

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

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30-808-2844 (Quartz outer tube) & 30-808-2862 (Ceramic outer tube)

1. GENERAL SAFETY

- Always wear safety gloves (item 9) 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
- Do not allow the 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'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: -

Note: A tapered ferrule is permanently fixed to the to the outer tube – *do not attempt to remove the ferrule from the tube.*

- 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 (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.



Ste 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 alumina inner tube from D-Torch body

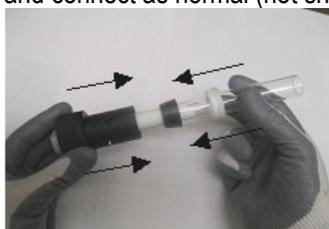
3. ATTACH D-TORCH OUTER TUBE

To attach the outer tube, complete the following steps: -

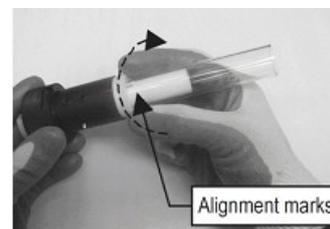
- 3.1. **Check**, that both locating surfaces (outer tube and torch body) are clean and free from damage.
- 3.2. Carefully slide the outer tube over the inner tube – the outer tube will self locate into the torch body.
- 3.3. Tighten the retainer to fix the outer tube in place (moderate pressure by hand is adequate). **Check**, that the tube and torch body alignment marks are aligned.
- 3.4. If required, return torch assembly to ICP and connect as normal (not shown).



Step 3.1.



Step 3.2.



Step 3.3.

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4. ACCESS D-TORCH INJECTOR

To remove the injector

4.1 Unscrew the injector adaptor from rear of D-Torch then carefully remove the adaptor (with injector) from D-Torch.



Step 4.1a



Step 4.1b



Step 4.1c

4.2 Pull the injector out from the injector adaptor

Note! Check condition of the ferrule. Replace ferrule if damaged or deteriorated. (Refer section 5.)



Step 4.2a



Step 4.2b



iCAP Plug - refer note below

iCAP Plug: Do not remove this Plug from the D-Torch body - This Plug must be left in place for all iCAP Radial applications

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. REPLACEMENT OF INJECTOR FERRULE

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

5.1 Insert the injector ferrule tool (item 8) into injector ferrule then pivot tool sideways to unseat the ferrule from the injector adaptor - Discard ferrule.

Note! 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



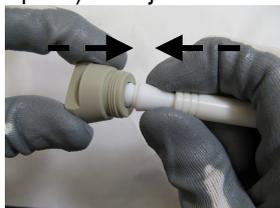
Step 5.1c

5.2 Place a new injector ferrule (from D-Torch injector consumable kit, 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.

Hint! It can help if you swivel (pivot, like step 5.1) the injector ferrule tool whilst pushing-in the injector ferrule.



Step 5.2a



Step 5.2b



Step 5.2c

Note! If you have questions regarding the D-Torch or this document, please contact your supplier.

Installation guide

D-Torch* ceramic outer tube

Option for iCAP 6000 DUO

Appendix A Ceramic outer tube (option for standard D-Torch)

If desired, it is possible to operate D-Torch with a durable ceramic outer tube - You can purchase either; A complete D-Torch with additional ceramic outer tube and accessory items, part number 30-808-2862, or just the ceramic outer tube and accessory items, supplied in a kit, part number 31-808-3079 as listed in the table below.

Item No.	Part Number	Description	Qty
1	31-808-3834	D-Torch iCAP 6000 Duo Ceramic outer tube	1
2	31-808-2933	Optic fibre	1
3	31-808-3117	Optic fibre 450 assembly	1
4	31-808-3211	Bulkhead connector	1
5	31-808-2971	Blanking plug iCAP 6000 duo Torch box	1
6	2497	Screwdriver 3mm straight blade	1

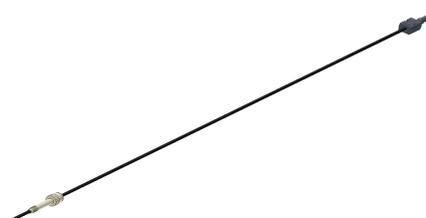
Item 1



Item 2



Item 3



Item 4



Item 5



Item 6



When using the D-Torch with the ceramic outer tube, the following issues **must be** considered: -

Align torch function (iCAP 6000 Software)

The 'Align Torch' function in the iCAP 6000 software may not operate correctly with the ceramic outer tube in place. Therefore, it is recommended that you align the D-Torch with the quartz outer tube in place before changing to the ceramic outer tube

Plasma ignition detection

Inside the iCAP torch box, there is a sensor that detects light and signals when the plasma is active. The opaque nature of the ceramic outer tube prevents sufficient light reaching the torch box sensor. To overcome this problem, an optic fibre is supplied to convey light from the D-Torch to the ICP sensor. Fitting the optic fibre assembly to the iCAP 6000 ICP is a minor change

Two different optic fibre assemblies are supplied with this kit, one for each iCAP 6000 ICP variant: -

iCAP 6000 models up to the year 2010

The shorter 'optic fibre assembly' (kit item 2) and 'blanking plug' (Kit item 4) is used.

iCAP 6000 models from the year 2011 onwards

The longer 'optic fibre 450 assembly' (kit item 3) is used.

The following page details the necessary steps to fit both optic fibre types.

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D-Torch ceramic outer tube

Option for iCAP 6000 DUO

iCAP 6000 models up to the YEAR 2010

To fit the optic fibre assembly (conveys light from the D-Torch to the ICP) perform the following: -

- A.1 If fitted, remove existing Torch from ICP (not shown).
- A.2 Remove slotted plug from rear of D-Torch using screwdriver provided (Item 5)
- A.3 Mount D-Torch in torch box as usual.
- A.4 Insert optic fibre assembly (item 2) into rear of D-Torch and tighten lightly by hand



Step A.2

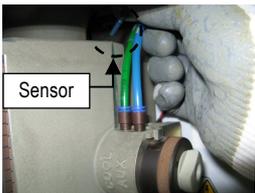


Step A.3



Step A.4

- A.5 Slide light sensor out from top of ICP torch box
- A.6 Plug sensor hole in ICP torch box using blanking plug (Item 3) supplied.
- A.7 Insert ICP sensor into rear of optic fibre assembly.
- A.8 Connect spray chamber as usual.



Step A.5



Step A.6



Step A.7



Step A.8

Note!

If you replace D-Torch with a conventional ICP torch, you must return light sensor to ICP torch box (steps A.7 to A.4 in reverse order)

iCAP 6000 from the YEAR 2011 onwards

To fit the optic fibre assembly (conveys light from the D-Torch to the ICP) perform the following: -

- B.1 If fitted, remove the existing Torch from ICP (not shown).
- B.2 Remove slotted plug from rear of D-Torch using the screwdriver provided (Kit item 5) – Shown figure A.2, above.
- B.3 Mount D-Torch in torch box as usual.
- B.4 Fasten (screw clockwise) threaded end of bulkhead connector (item 4) to ICP 'ACCESSORY' port.
- B.5 Insert the threaded-end of optic fibre assembly (item 3) into rear of D-Torch and tighten lightly by hand.
- B.6 Insert the other end of the optic fibre assembly into the recently installed (Step B4) ICP bulkhead connector.
- B.7 Connect spray chamber as usual. (Not shown)



Step B.3



Step B.4



Step B.5



Step B.6

Note!

If you replace D-Torch with a conventional ICP torch, you must remove the optic fibre from the ICP socket (step B.5)