Instruction manual



Unitor Combination Torch UCT-500



Notes	



Instructions for use

Unitor Combination Torch UCT-500

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Attention

Please use these Unitor products exclusively for the purpose indicated and only if the operator fully understands current practices and procedures. If any further information or assistance is required please contact your local Unitor specialist.



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General description

The Unitor Combination Torch UCT-500 covers all normally occurring heating, brazing, welding and cutting applications for which the acetylene/oxygen flame may be used on board.

The torch is simple to use, light in weight compared to capacity, well balanced and easy to handle.

It is a high-pressure torch of the equalized pressure type. One of the advantages of a high-pressure torch is an especially stable flame and high resistance to persistent flashback.

The connection between torch handle and heating/welding/cutting attachments is based on 0-ring seals which ensures a gas-tight connection even if the connection nut should loosen.

Attachments are easily changed without the use of tools, and may be turned in any desired angle to the handle/gas valves. The gas valves are symmetrically placed at the back of the handle and suit both left-and right-handed persons.

Acetylene and Oxygen inlets are fitted with non-return valves as standard. The non-return valve is a spring-loaded valve that permits the gas to pass in one direction only; towards the blowpipe. It is fitted to the blowpipe handle to prevent any return flow that could allow gases to mix in the hoses, with the danger of hose explosions. Non-return valves, however, do not replace flashback arrestors in the gas supply system.

UCT-500 Master Kit

The UCT-500 Master kit has been assembled to cover all ordinary welding, brazing and cutting work that may occur on board. It includes a range of 7 welding attachments, covering most brazing/welding applications. The larger attachments also function as mono-flame heating attachments. Cutting nozzles covering cutting of steel up to 100 mm are included, also a roller guide with clamp sleeve for cutting edges from 90° to 45° angle of plate surface. The circular motion bar with centering pivot attaches to the roller guide and allows for easy cutting of circular holes up to 960 mm diameter by replacing the clamp sleeve in the roller guide with the sleeve for circular motion. In addition to spanner, cleaning needles and a spare parts kit with all the most commonly needed spares, the UCT-500 case contains an instruction book giving complete information on the use and maintenance of the equipment.

UCT-500 Compact Kit

The compact kit contains the UCT-500 shank, the three most commonly used welding attachments (80 ltr, 230 ltr and 650 ltr) and the cutting attachment with nozzles for cutting up to 25 mm steel. Cleaning needles, spanner and full instructions for use and maintenance are also included.





UCT-500 Master Kit, Product no 170-500000



UCT-500 Compact Kit, Product no 170-500001

Operating instructions for UCT-500 Cutting Torch

Α

All valves are shut at the commencement of work: Cylinder valves (1 and 2) are shut, the regulator adjusting screws (3 and 4) are screwed so far out that they run freely on their threads, and all torch valves(5, 6, 7 and 8) are closed.

B

Select the cutting nozzle (9) to suit the type and thickness of the workpiece. The required nozzle and working pressure for mild steel when using 6 mm (1/4) hoses 10 m long are given in the cutting table. Other materials and hoses may require other nozzles and working pressures than those given in the table.

C

Slowly open the cylinder valves for Oxygen (1) and Acetylene (2).

D

Fully open the torch Oxygen needle valve (5) and the valve for preheating Oxygen (7). Then press the cutting Oxygen valve lever (8), and adjust the working pressure by means of the Oxygen regulator adjusting screw (3).

 \mathbf{E}

Release the cutting Oxygen valve lever (8) and shut the valve for preheating Oxygen (7).

\mathbf{F}

Fully open the torch Acetylene needle valve (6), and adjust the working pressure by means of the Acetylene regulator setting screw (4).

G

Slightly open the preheating Oxygen valve (7) to provide a little extra Oxygen to prevent troublesome soot from the flame when the torch is lit.

Н

Light the torch and adjust to neutral flame, using the valve for preheating Oxygen (7).

I

Press down the cutting Oxygen lever (8) and readjust to normal flame by means of the valve for preheating Oxygen (7). The torch is now ready for cutting.

NB. When cutting, the torch Oxygen needle valve must be kept fully open.

J

In the event of sustained backfire, which is recognized by a whistling or hissing sound, first close the valve for preheating Oxygen (7) as quickly as possible, releasing the cutting Oxygen valve lever (8) at the same time. Then shut the torch Acetylene needle valve (6).

K

The torch is normally extinguished by first closing the torch Acetylene needle valve (6) and then the valve for preheating Oxygen (7). Finally, relieve the pressure in the hoses and close all valves.



Important

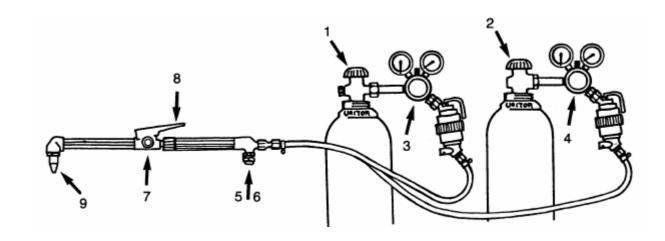
After finishing work, release the pressure in the hoses by closing the cylinder valves (1 and 2) and empty one hose at a time, keeping the torch needle valve for the other gas shut.

Finally, make sure that all torch valves are shut, and unscrew the regulator adjusting screws (3 and 4) so far that they run freely on their threads.

Check the sealing rings at regular intervals for damage, deformation or wear. Replace them if they are defective.

To facilitate changes of torch or cutter tips, the sealing rings and sealing surfaces in the torch connection head should be lightly smeared with a special lubricant.

Oil or grease must never be used.



Cutting table UCT-500

Material thickness, mm	3 - 10	10 - 25	25 - 50	50 - 100
Acetylene pressure bar	0,2	0,2	0,2	0,3-0,8
Oxygen pressure bar	1,0-2,5	1,5-4,0	1,5-4,0	3,0-6,0
Product No.	170-174698	170-174706	170-174714	170-174722
Cutting nozzle, type no.	2	3	4	5
Gas consumption I/h Ox	1600	3600	6800	7800-14100
Gas consumption I/h	300	400	500	700
Cutting speed mm/min	950-430	580-350	500-300	380-180

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Cutting procedure

Oxygen cutting is a process in which mild steel burns (oxidizes) in oxygen. It is not a melting process.

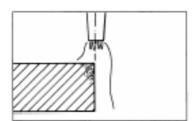
The work-piece is heated up to approximately 1000 °C, – after which oxygen is applied, which burns (cuts) mild steel.

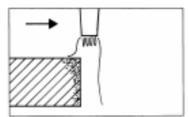
When cutting, it is important to move the cutting torch nozzle evenly.

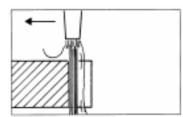
This is most easily done, by starting the cut as far away from you as practicable. Then bring the cutting torch towards you.

Starting the cut from an edge

- 1. Direct the preheating flame against the starting point at the edge of the plate. Keep the flame cores 2–3 mm above the steel plate and preheat until the steel is brightly red hot.
- 2. Move the torch tip slightly off the edge of the plate to ensure that the cutting Oxygen jet passes the edge of the plate. Open slowly but fully for the cutting Oxygen by depressing the cutting Oxygen lever. Keep the nozzle at the distance from the plate indicated in the cutting table (2–5 mm) and move the nozzle onto the plate.
- 3. Guide the torch steadily along the line to be cut. Use a cutting speed within the limits given in the cutting table and ensure that the slag blows through completely resulting in a steady stream of sparks downwards from the bottom of the cut.

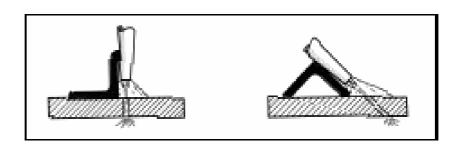






Improving cuts

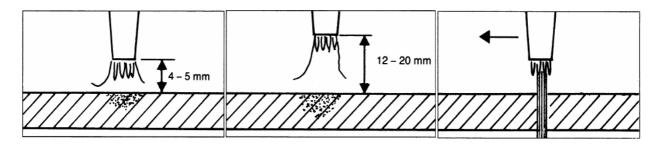
A piece of angle iron can be clamped to the plate being cut. The angle iron can be used to guide the torch for both square and bevel cuts.





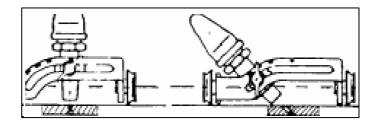
Starting a cut by piercing

- Direct the preheating flame against the starting point. Keep the flame cores 4
 5 mm above the steel plate and preheat until the steel is red to white hot.
- 2. Lift the nozzle to approximately 12–20 mm above the surface. Open slowly for the cutting oxygen. Make sure that spatter of molten metal does not reach the nozzle tip, if necessary by inclining the torch slightly so that the sparks fly sideways.
- 3. With the cutting oxygen lever fully depressed lower the nozzle as the cutting jet pierces the plate. Keep the nozzle at correct distance from the plate (see cutting table) and proceed in the direction to be cut.



Cutting guide

The guide should be used in order to ensure smooth cutting in steel plate. In this guide the torch may be used in any angle between 90° and 45° to the surface.



By using the sleeve for free movement of the nozzle in the guide and attaching the circular motion bar with center tip complete circles with radius 42 to 480 mm may be cut.





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Operating Instructions For UCT-500 Brazing, Welding, Heating Torch

Α

All valves are shut at the commencement of work:

Cylinder valves (1 and 2) are shut, the regulator adjusting screws (3 and 4) are screwed so far out that they run freely on their threads and both torch needle valves (5 and 6) are closed.

B

Select your blowpipe (10) to suit the type and thickness of workpiece.

The required blowpipe and working pressure for mild steel when using 6 mm (1/4") hoses 10 m in length are given in the welding table.

The working pressures relate to medium-strength flame.

 \mathbf{C}

Slowly open the cylinder valves for Oxygen (1) and Acetylene (2).

D

Fully open the torch Oxygen needle valve (5) and adjust the working pressure by means of the Oxygen regulator adjusting screw (3).

E

Shut the torch Oxygen valve (5).

F

Fully open the torch Acetylene needle valve (6), and adjust the working pressure by means of the Acetylene regulator adjusting screw (4).

G

Slightly open the torch Oxygen needle valve (5) to provide a little extra Oxygen to prevent troublesome soot from the flame when the torch lightening lit.

Η

Hold the torch so that the nozzle points away from flammable objects.

Light the torch, and adjust to desired flame characteristic by means of the torch Oxygen needle valve (5). The torch is now ready for use.

I

In the event of sustained backfire, which is recognized by a whistling or hissing sound, first close the torch Oxygen needle valve (5) as quickly as possible, then the Acetylene needle valve (6).

J

The torch is normally extinguished by first closing the torch Acetylene needle valve (6) and then the torch Oxygen needle valve (5). Finally, relieve the pressure in the hoses and close all valves.



Important

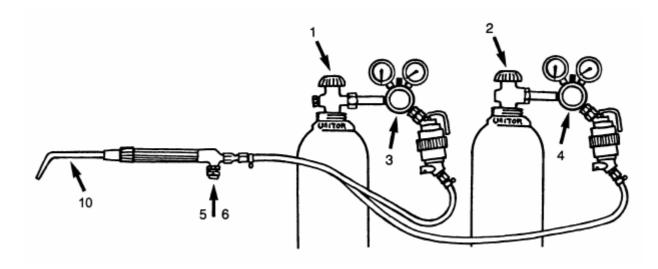
After finishing work, release the pressure in the hoses by closing the cylinder valves (1 and 2) and empty one hose at a time, keeping the torch needle valve for the other gas shut.

Finally, make sure that all torch valves are shut, and unscrew the regulator adjusting screws (3 and 4) so far that they run freely on their threads.

Check the sealing rings at regular intervals for damage, deformation or wear. Replace them if they are defective.

To facilitate changes of torch or cutter tips, the sealing rings and sealing surfaces in the torch connection head should be lightly smeared with a special lubricant.

Oil or grease must never be used.



Select the correct blowpipe to suit the thickness and size of material to be welded. Adjust the working pressure for one gas at a time.

To adjust the working pressure, open the torch needle valve so that the gas can flow freely during adjustment.

Table for welding, brazing and heating

Working pressure and gas consumption for Combination Torch UCT-500									
Material thicknes	S	>0,5	0,5	2	3	5	Major welding / brazing		brazing
mm			1	3	5	7	(heating torch)		ch)
Product no.		174565	174573	174581	174599	174607	174615	174623	174631
Size of blowpipe	ре		80	230	400	650	1000	1250	1800
Gas consumption	Ох	40	80	230	400	650	1000	1250	1800
litre per hour	Ac	39	73	209	364	591	909	1136	1636



Maintenance and repairs

Important:

Protect the torch parts from damage. Keep the parts stored in the case or cabinet from Unitor which is intended for this purpose.

Always check parts visually for any signs of damage before use.

If it is suspected that the torch shank, cutting attachment nozzle or blowpipe is not functioning correctly, or is found to have any form of a leak, remove the part from service immediately.

Do not, under any circumstances, undertake or allow any repairs by unauthorized personnel.

Replacing o-rings

A defective o-ring may be removed by cutting it partly through with a sharp knife/or stretching it off with a slender steel hook or similar instrument.

Be careful not to damage the metal surfaces.

The new o-ring must be rolled or pushed cautiously into position. Take care that the ring is not cut by threads or otherwise damaged during fitting.

Shank Valves and Preheat Oxygen Valve

By tightening or loosening the packing nut, the valve spindle resistance to turning may be adjusted.

Only a slight tightening of the nut is necessary to obtain a perfect seal.

If a leakage along the valve spindle should occur, only a slight tightening of the packing nut should be required.

In the case of leakage at the valve seat, remove the valve stem assembly and clean this as well as the seat with a clean rag.

If damaged the valve stem assembly must be replaced.

NOTE: Use only Oxygen compatible lubrication.

Lubrication

Lubricating carried out in any other way or with any other lubricants than recommended in the following, may cause damage or even be dangerous.

At following points, the lubricant for O-rings is applied thinly:

- The sealing surfaces for the o-rings in the front body of the shank.
- The cutting oxygen valve stem, the. two big o-rings on the valve seat and the cutting oxygen lever pin.
- The end surface of the nozzle screw. This prevents the nozzle from turning with the screw when tightening. It also facilitates the adjustment and protects the seating cones.

The threads, cones and stems of the shank and preheat oxygen valve spindle should be lubricated with the lubricant for valve spindles.



Maintenance of Blowpipes

Clean the flame and cutting oxygen holes with Unitor cleaning drills.

These should run freely in the holes.

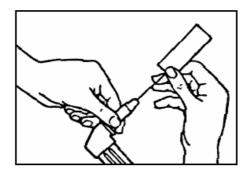
Do not twist them, just stick them straight in and pull them out.

Never use steel wire, reamers or spiral drills for cleaning. These can ruin the smooth surfaces of the hole.

It is very important that the small holes in the sealing end of the cutting nozzles should not be enlarged in any way.

Torches and cutting nozzles may be carefully cleaned externally by means of a soft brass brush.

Do not use a steel brush.

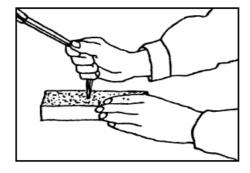


Smoothening the tip of blowpipes and cutting nozzles

If the end of a welding or cutting nozzle has been damaged, it can be repaired, by grinding the surface against fine emery paper placed on a flat surface.

The correct flame and an even flow of cutting oxygen can be obtained only by keeping the edges of the holes sharp and at right angles to the axis of the passages. This may also reduce the risk of backfire.

Note: This cleaning of a blowpipe or cutting nozzle tip surface must not be repeated to the extent that excessive material is removed. That will lead to larger diameter of the gas channel openings and may lead to backfire.



Smoothening the nozzle end of a blowpipe



Part list and spares

S	h	a	n	k
•		а		n

Description	Product No.
1)2) Shank complete w/ sockets and non-return valves	170-174656

Welding attachments

Size ³	*	Material thickness mm	Product No.
1)	0-A 40	<0,5	170-174565
1)2)	0-A 80	0.5-1.0	170-174573
1)2)	0-A 230	2-3	170-174581
1)	0-A 400	3-5	170-174599
1)2)	0-A 650	5-7	170-174607
1)	0-A 1000	7-10	170-174615
1)	0-A 1250	9-14	170-174623

Flexible welding attachments

These attachments can be bent to any desired shape.

Size*	Material thickness mm	Product No.
0-A160	1-2	170-183780
0-A315	2-4	170-183798
0-A500	4-6	170-183806

Single flame heating attachments

Size*	Product No.
0-A 1500	170-174631
0-A 2500	170-234864
0-A 5000	170-183756

Multi flame heating attachments

Size*	Product No.
0-A1000	170-603415
0-A2500	170-603407
0-A5000	170-603399

Cutting attachments

Des	cription	Product no.:
	Cutting attachments 75° Head Angle	170-174664
1)2)	Cutting attachments 90° Head Angle	170-234807
	Cutting attachments 0° Head Angle	170-234815

Cutting nozzles- general use

Description	Capacity	Gas consumption		Product
Туре	mm	OX nl/h	Ac nl/h	no.
1)2) No. 2	3-10	1300	460	170-174698
1)2) No. 3	10-25	2150	520	170-174706
1) No. 4	25-50	5650	690	170-174714
1) No. 5	50-100	7800	810	170-174722

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Cutting nozzles for difficult access.

Description	Capacity	Gas consumption		Product
Туре	mm	OX nl/h	Ac nl/h	Product no.
Length 153mm	25-40			170-183863
Length 140 mm	40-75			170-183855

Gouging nozzle with stellite tip

Furrow dimensions	Gas consumption		Product
Width mm Depth mm	OX nl/h	Ac nl/h	Product no.
8-11 6-11	11500	1750	170-174730

Cutting guides

Description		Product No.
1)	Roller guide 0°-45° nozzle angle with clamp sleeve	170-174672
1)	Circular motion bar complete, 84–960 mm with c.m. sleeve	170-174680

Tools and lubrication

Description		Product No.
1)2)	Spanner for UCT-500	170-174649
1)2)	Cleaning needles for UCT-500 nozzles	176-175356
	Lubricant for valve spindles	170-174854
	Lubricant for O-rings	170-234997

Spares

Description	Product No.
Socket/ Non-return valve for shank AC, 6 mm	170-597336
Socket/ Non-return valve for shank OX, 6 mm	170-597344
Socket/ Non-return valve for shank AC, 9 mm	170-651265
Socket/ Non-return valve for shank OX, 9 mm	170-651257
Flashback arrestor set FR-20AC+OX, for X-21 shan	ık 170-619270
1) SPARE PART KIT COMPLETE	170-174748
Containing 1 of each item below:	
Oxygen valve assembly (blue)	170-174789
Acetylene valve assembly (red)	170-613762
0-ring set for welding/cutting attachments	170-535005
Coupling nut welding/cutting attachments	170-174771
Coupling screw for cutting nozzles	170-174813
Clamp sleeve for roller guide	Not available as separate item
Sleeve for circular motion in roller guide	Not available as separate item

¹⁾ Included in Master Kit 2) Included in Compact Kit



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Fraser/surrey Gaspe Gros Caouna Halifax Hamilton Harbour Grace H Westminster Bc Pictou/halifax Pointe Aux Pic.quebec Port Alfred Port C halifax Squamish St. Catherines St.john's, Nfld St.romuald Stephens alleyfield Vancouver Victoria Weymouth Windsor Yarmouth Ancud / L.

Instruction manual

& spare part list

Vicente Talcahuano Tocopilla Valparaiso Antilla Bahia Honda Banes Baracoa Cabanas Caibarien Cardenas Casilda Ceiba Hueca Cienfuegos Guantanamo Guayabal Havana Isabel De Sagua Manati Mariel Media Luna Moa Nicaro Niguero Nuevitas Pilon Puerto Padre Santiago De Cuba Sigloo Genoa Finn Tanamo Tunas De Zaza Vita Balao Esmeraldas Guayaquil La Libertad Manta Puerto Chimbote Ilo Matarani Paita Pisco Guayama Guayanilla Mayaguez Ponce San Juan Yabucoa St. Vincent Chaguaramas La Brea Point Anacortes, Wa Anchorage, ak Annapolis, md Antioch Aransas Pass Tx Astoria, Or Baltimore Baton Rouge Bayonne Baytown Beaumont Bellingham, Ma Bellingham, Wa Benicia, Ca Boston, Ma Bridgeport Bridgeport, Conn Brooklyn, Ny Brownsville Tx Brunswick Brunswick, Coos Bay, Or Corpus Chr.tx Crockett Darrow Davant Deer Park Delaware City Destrehan Donaldsonville Dutch Harbor, Ak Eastport, Me Eureka Everett, Wa Fairless Hills Famagusta Ferndale wa Freenort Tv Galveston Tv Garvville Geismar Georgetown, Sc Gloucester, Ni Good Hope Gramercy Grand Isl aii Hoquiam, Wa Houma Jacksonville Kalama Kalama, Wa Kenai Key V

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