



OWNER'S MANUAL

FOR

BLUE TORCH

MODEL: WTCX-3503	U4167
WTCMX-3503	U4168
WTCLX -3503	U4169

DO NOT DESTROY

IMPORTANT: Read and understand the entire contents of this manual, with special emphasis on the safety material throughout the manual, before installing, operating, or maintaining this equipment. This equipment and this manual are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate or maintain this equipment. Contact your distributor if you do not fully understand this manual.

DAIHEN Corporation WELDING PRODUCTS DIVISION

1: January 12, 1998


Upon contact, advise MODEL and MANUAL NO.


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1. SAFETY INFORMATION

The following safety alert symbols and signal words are used throughout this manual to call attention and to identify different levels of hazard and special instructions.

 WARNING	WARNING gives information regarding possible personal injury or loss of life.
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 CAUTION	CAUTION refers to minor personal injury or possible equipment damage.
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2. ARC WELDING SAFETY PRECAUTIONS

 WARNING	
ARC WELDING can be hazardous.	
◆	PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. Especially: <ul style="list-style-type: none">• Keep children away.• Pacemaker wearers keep away until consulting a doctor.
◆	Read and understand <ul style="list-style-type: none">• the summarized safety information given below and the original principal information that will be found in the table SAFETY STANDARDS.
◆	Have only trained and experienced persons perform installation, operation, and maintenance of this equipment.
◆	Use only well-maintained equipment. Repair or replace damaged parts at once.
ARC WELDING is safe when precautions are taken.	



ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and welding circuit is electrically live whenever the output of the welding power source is on. The power line and internal circuit of the welding power source are also live when line disconnect switch is on. In semiautomatic or automatic wire welding, wire reel, drive assembly, and all metal parts touching the welding wire are electrically live.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect line disconnect switch before installing, changing torch parts or maintaining this equipment.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Ground the workpiece.
7. Keep all panels and covers of this equipment securely in place.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not touch electrode and any metal object if POWER switch is ON.
10. Do not wrap weld cables around your body.
11. Turn off POWER switch when not in use.



ARC RAYS can burn eyes and skin. FLYING SPARKS AND HOT METAL can cause injury. NOISE can damage hearing

Arc rays from the welding produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some arc welding can damage hearing.

1. Wear a face protection with a proper shade of filter (See ANSI Z 49.1 listed in table SAFETY STANDARDS.) to protect your face and eyes when welding or watching.
2. Wear approved safety goggles.
3. Use protective screens or barriers to protect others from flash and glare: warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.



WELDING can cause fire and explosion.

Sparks and spatter fly from the welding arc. The flying sparks and hot metal, spatter, hot workpiece, and hot equipment can cause fires and explosion.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35ft. (10.7m). If this is not possible, tightly, cover them with approved covers.
 - Be alert that welding sparks and hot metals from welding can easily go through small cracks and openings to adjacent areas.
4. Watch for fire, and keep a fire extinguisher nearby
 - Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire hidden side.
5. Do not weld on closed containers such as tanks or drums.

Accidental contact of electrode or welding wire to metal object can cause sparks, overheating, or fire.

6. Contact work cable to workpiece as close to the welding area as practical
 - to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
7. Remove stick electrode from holder; cut off wire at contact tip when not in use.
8. Do not use the welding power source for other use than arc welding.
9. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

Loose weld cable connection can cause undesired sparks and excessive heating.

10. Tighten all weld cable connections.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

11. Wear approved face shield or safety goggles. Side shield recommended.
12. Wear proper body protection to protect skin.



FUMES AND GASES can be hazardous to your health.

Arc welding may produce fumes and gases hazardous to health.

1. Keep your head out of the fumes; do not breath the fumes.
2. Ventilate the area and / or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacture's instruction for metals, consumables, coatings, and cleaners.
5. Do not cut in locations near degreasing, cleaning, or spraying operations.

The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.20402.

Recommended Practices for Plasma Arc Cutting, American Welding Society Standard AWS C5.2, from American Welding Society, 550 N.W. Lejeune Rd, Miami, FL 33126.

Recommended Safe Practices for the Preparation for Welding and cutting of containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. Lejeune Rd, Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety Welding and Cutting, CGA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

3. NOTICE AT OPERATION

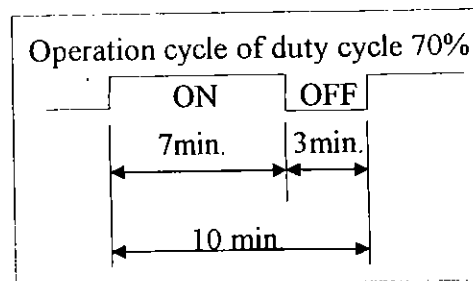
3.1 Rated duty cycle

⚠ CAUTION

● Use at the rated duty cycle or under. If exceeding the rated duty cycle, the welder may be deteriorated and burned.

Welding torch	Rated duty cycle
WTCX-3503	350A, 70% (CO ₂)
WTCMX-3503	300A, 30% (MAG)
WTCLX-3503	

- The duty cycle is expressed by a 10 minutes. A duty cycle 70% is to charge rated output current for seven minutes and by pausing for three minutes.



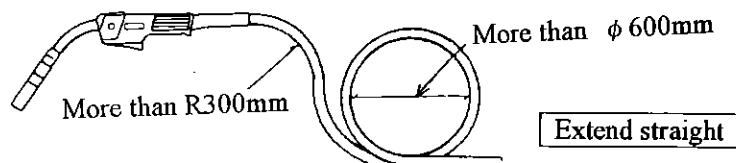
- If exceeding the rated duty cycle of welding power source and torch, temperature rise of welding power source and torch exceed the allowable temperature, and it can be a cause of burning.

3.2 Bending of power cable

⚠ CAUTION

• Observe the following to acquire high welding performance.

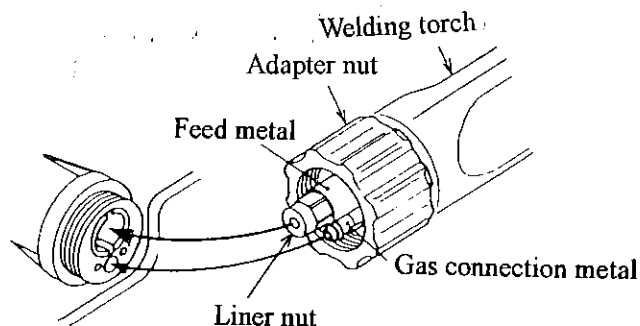
- If power cable of torch is bent excessively, smooth wire feeding will be hampered. Therefore, take care not to bend it too much.



3.3 Connection to wire feeder

! CAUTION

- Securely tight the adapter nut of welding torch. If loosen it, it can be cause of fire, burning and breakdown.



Surely insert the feed metal fitting and gas connection metal fitting of the welding torch and the wire feeder, check that the adapter nut is screwed in smoothly, and tighten. (If screwed in forcibly, the threads might be broken.)

- Liner nut can be fixed by hand. Do not use tools. (Spanner etc.)

3.4 Inching operation

! WARNING



- Do not look into the tip's hole to check on sending of the wire in inching. Wire may fly out and stick your face and eyes, and it can be cause of injury.
- Do not bring the welding torch tip near your face, eyes and body in inching. Wire may fly out and stick your face, eyes and body, and it can be cause of injury.

- Straighten the welding torch, and wire feeds with pushing the inching switch, then leave it when wire comes out about 10mm from the tip of welding torch.

3.5 Replacing of parts

! CAUTION

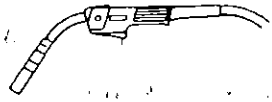

- Be sure to observe the followings for preventing burning.
- At welding, never touch the high temperature parts of nozzle and tip directly.
- At welding, use the protection goods
- The replacing of tip of welding torch should be after cooling down.

! CAUTION

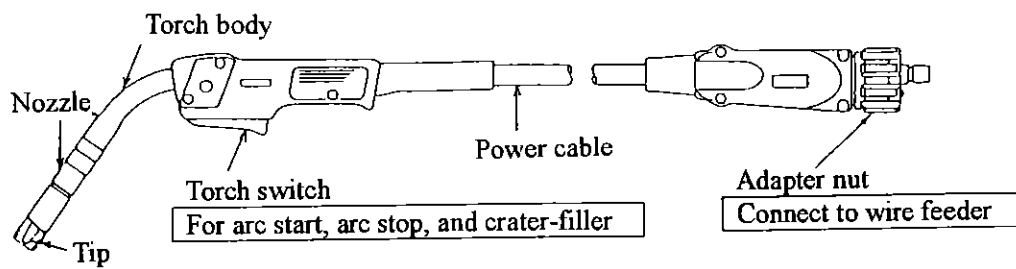
- In case of parts are damaged, replace them to new parts for safety and quality.
- Be sure to use the OTC's genuine parts.

4. CHECK OF PACKAGE CONTENT

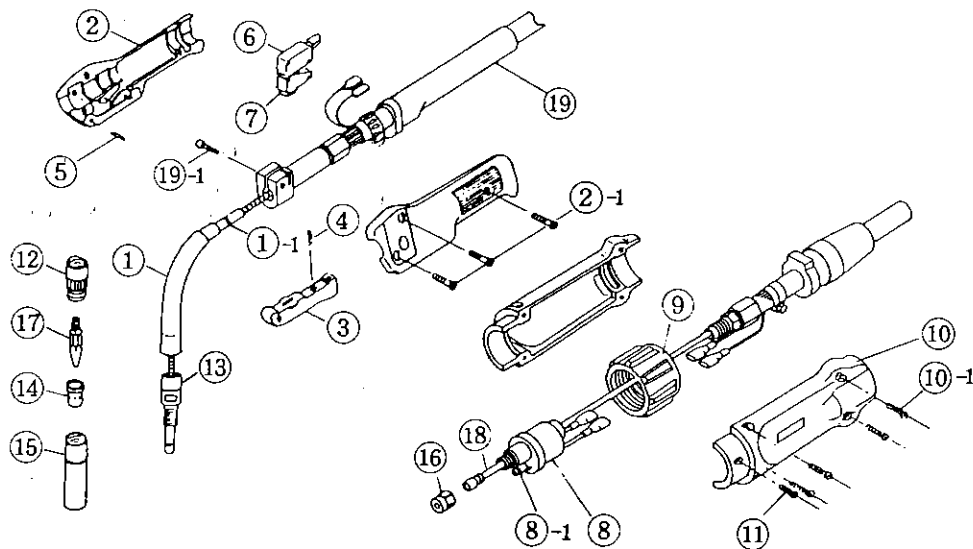
● Check the quantity of parts when open.

Welding torch	Accessory			
		Description	Specification	Q'ty
		Hexagon rod spanner	No. 4 (For M5)	1

5. DESCRIPTION AND OPERATION OF EACH PART



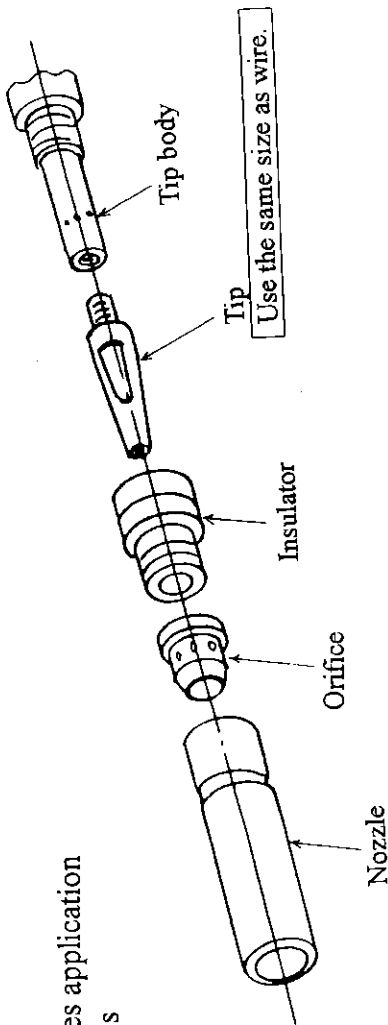
6. PARTS LIST



6.1 Standard parts

No.	Parts No.	Description	Q'ty
1	U4167B00	Torch body	1
1-1	3570-124	"O" ring	(1)
2	U4167C00	Handle (WTCX)	1 set
2	U4168C00	Handle (WTCMX)	1 set
2	U4169C00	Handle (WTCLX)	1set
2-1		Small screw (M4 × 20)	(3)
3	U4167C03	Trigger	1
4	U2853C04	Spring	1
5	3361-207	Flat pin (φ 4-16)	1
6	4254-015	Micro switch	1
7	U2853C05	Switch cover	1
8	U4167E00	Feeding adapter	1
8-1	3570-125	"O" ring	(1)
9	U4167F03	Adapter nut	1
10	U4167F00	Cable support (WTCX)	1 set
10	U4168F00	Cable support (WTCMX)	1 set
10	U4169F00	Cable support (WTCLX)	1 set
10-1		Small screw (M4-16)	(4)
11		Small screw(M4-8)	1
12	U4167L00	Insulator	1
13	U4167G03	Tip body	1
14	U4167G02	Orifice	1
15	U4167G01	Nozzle (No. 10)	1
16	U4167G06	Liner nut	1
17	K980B54	Tip (1.2)	1
18	U4170H02	Liner (0.9~1.2) 3m (WTCX)	1
18	U4171H01	Liner (1.0~1.2) 4m (WTCMX)	1
18	U4172H01	Liner (1.2) 6m (WTCLX)	1
19	U4167D00	Power cable (3m) (WTCX)	1
19	U4168D00	Power cable (4m) (WTCMX)	1
19	U4169D00	Power cable (6m) (WTCLX)	1
19-1		Bolt with hole (M5-14)	(1)

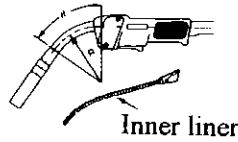
6.2 Optional accessories application
 (1) Torch renewal parts



● Torch parts and renewal nozzle (Torch performance is improved by nozzle replacement)

Standard including parts		Replacing nozzle (optional)																				
Tip body	Insulator	Orifice	Standard nozzle	For small current	For middle large current	For arc spot	For deeply or narrow space															
U4167G03 79.5 M14x1 W1/2	U4167L00 W1/2 φ17.5xφ15.5x4	U4167G02 21	U4167G01 73	U4167H01 73	U4167H16 73 For thick one U4167H02 77	U4167H03 88	U4167H04 100 Combine with long tip 61.5 Long tip															
<p>• High frequency duty cycle nozzle Kit (Kit No. U4167M)</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Parts No.</th> <th>Qty</th> </tr> </thead> <tbody> <tr> <td>1 Insulator</td> <td>U4173L00</td> <td>1</td> </tr> <tr> <td>2 Orifice</td> <td>U2774E03</td> <td>1</td> </tr> <tr> <td>3 Nozzle</td> <td>U4173G01</td> <td>1</td> </tr> <tr> <td>4 Tip body</td> <td>U4173G03</td> <td>1</td> </tr> </tbody> </table> <p>• Use it when MAG spray MAG pulse welding by WTC(M/L)X (Tip: For MAG). • Exchange nozzle for WTCX-5002 is able to use.</p>								Description	Parts No.	Qty	1 Insulator	U4173L00	1	2 Orifice	U2774E03	1	3 Nozzle	U4173G01	1	4 Tip body	U4173G03	1
Description	Parts No.	Qty																				
1 Insulator	U4173L00	1																				
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3 Nozzle	U4173G01	1																				
4 Tip body	U4173G03	1																				

● Torch body combination figure (◎ : Built in body ○ : Be able to install)



Select by welding condition.

Torch body	Parts No.	U4167B00	U4167N00	U4167P00	U4167Q00	U4167R00	U4188B00	U4173B00	K4945A00
	R	77	—	100	100	50	115	130	Flexible
θ°	55°	Straight	35°	55°	65°	55°	55°	$\pm 45^\circ$	
Inner liner	Parts No.	U4167G05	U4167G05	U4167H17	U4167H18	U4167H19	U4188G05	U4173G05	K4913C03
Torch model	WTC(M)(L) X-3503	◎	○	○	○	○	○	○	○

● Tip (Select by welding condition)

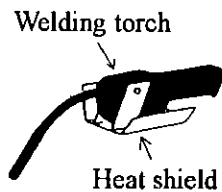
Wire size	0.8mm	0.9mm	1.0mm	1.2mm	1.4mm	1.6mm
For CO ₂	K980B57	K980B56	K980B55	K980B54	K980B58	K980B53
For CO ₂ (machine processing)	K662B13	K662B12	K662B08	K662B07	K662B14	K662B06
For MAG	—	U4167H14	U4167H13	U4167H12	U4167H11	U4167H10

● Liner

Cable length	Welding torch	Linner length	Parts No.	Applicable wire size (ϕ)
3 m	WTCX-3503	3 m	U4170H02 (Built in body)	0.9~1.2
			U4173G04 (For replace)	1.2~1.6
4 m	WTCMX-3503	4 m	U4171H01 (Built in body)	1.0~1.2
			U4174G04 (For replace)	1.2~1.6
6 m	WTCLX-3503	6 m	U4172H01 (Built in body)	1.2
			U4175G04 (For replace)	1.4~1.6

● Heat shield

Part No. : U2075J01



It guards users from radiation heat of base metal.
(It can be attached without tools)

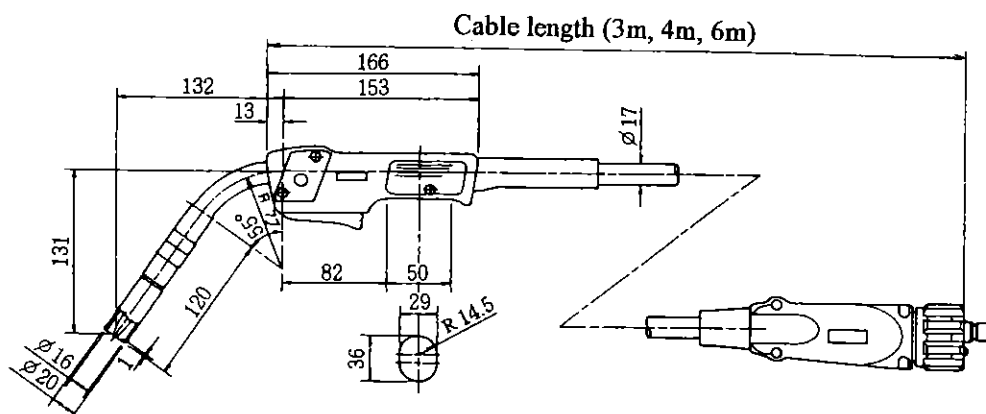
7. SPECIFICATION

7.1. Specification

Model	WTCX-3503	WTCMX-3503	WTCLX-3503
Max. applicable current	350A, CO ₂ (300A, MAG)		
Duty cycle	70% CO ₂ (30%, MAG)		
Usable wire	Solid wire, Cored wire		
Usable wire size	(0.9), (1.0), 1.2, (1.4)	(1.0), 1.2, (1.4)	1.2, (1.4)
Cable length	3m	4m	6m
Mass. (With cable)	2.5kg	3.1kg	4.1kg

Note: When use the wire size of“()”, optional parts are required.

7.2 External view



7.3 Wire feeder (Be able to combination type)

Model	Standard combination	Wire feeder which need connection adapter	For connection adapter 350A (Part No: K4902A00)
WTCX-3503	CM-2301, CM-2302	CM-231 (S-3)	
WTCMX-3503	CM-5001	CM-501	
WTCLX-3503	CML-2301, CML-2302 CM-5001	CML-231 (S-3) CM-501	

● Each type adapter for other corporation are prepared