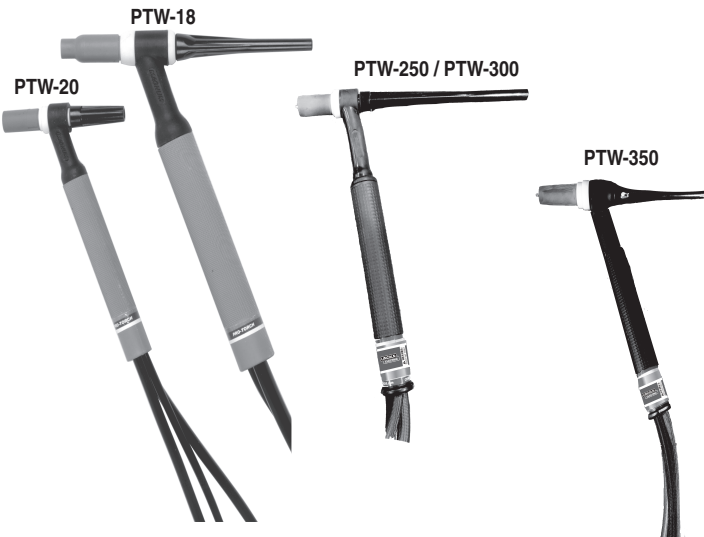




Operator's Manual

PRO-TORCH™ WATER-COOLED



Model Numbers:
**PTW-20, PTW-18, PTW-250,
PTW-300, PTW-350**



Register your machine:
www.lincolnelectric.com/register
Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.



CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.



KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

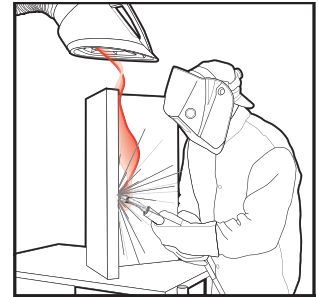
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**



SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.



SECTION A: WARNINGS



CALIFORNIA PROPOSITION 65 WARNINGS

Diesel Engines

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Gasoline Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE POWERED EQUIPMENT.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



- 1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

- 1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.



- 1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.



- 1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- 1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
- 1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
 - 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
 - 2.d.2. Never coil the electrode lead around your body.
 - 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
 - 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
 - 2.d.5. Do not work next to welding power source.



ELECTRIC SHOCK CAN KILL.



- 3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
 - DC Manual (Stick) Welder.
 - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
 - 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
 - 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
 - 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
 - 3.g. Never dip the electrode in water for cooling.
 - 3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
 - 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
 - 3.j. Also see Items 6.c. and 8.



ARC RAYS CAN BURN.



- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



FUMES AND GASES CAN BE DANGEROUS.



- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer's safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.



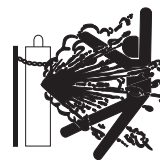
WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



- 6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 02269-9101.
- 6.j. Do not use a welding power source for pipe thawing.



CYLINDER MAY EXPLODE IF DAMAGED.



- 7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.



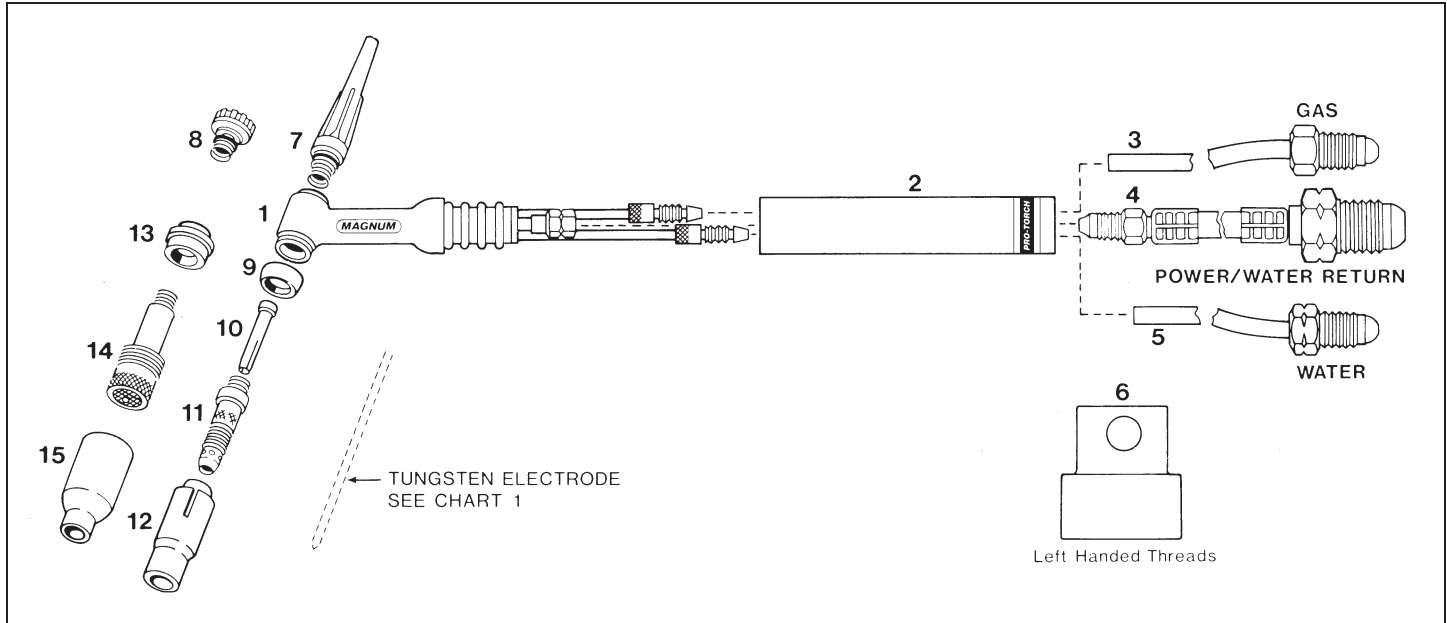
FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

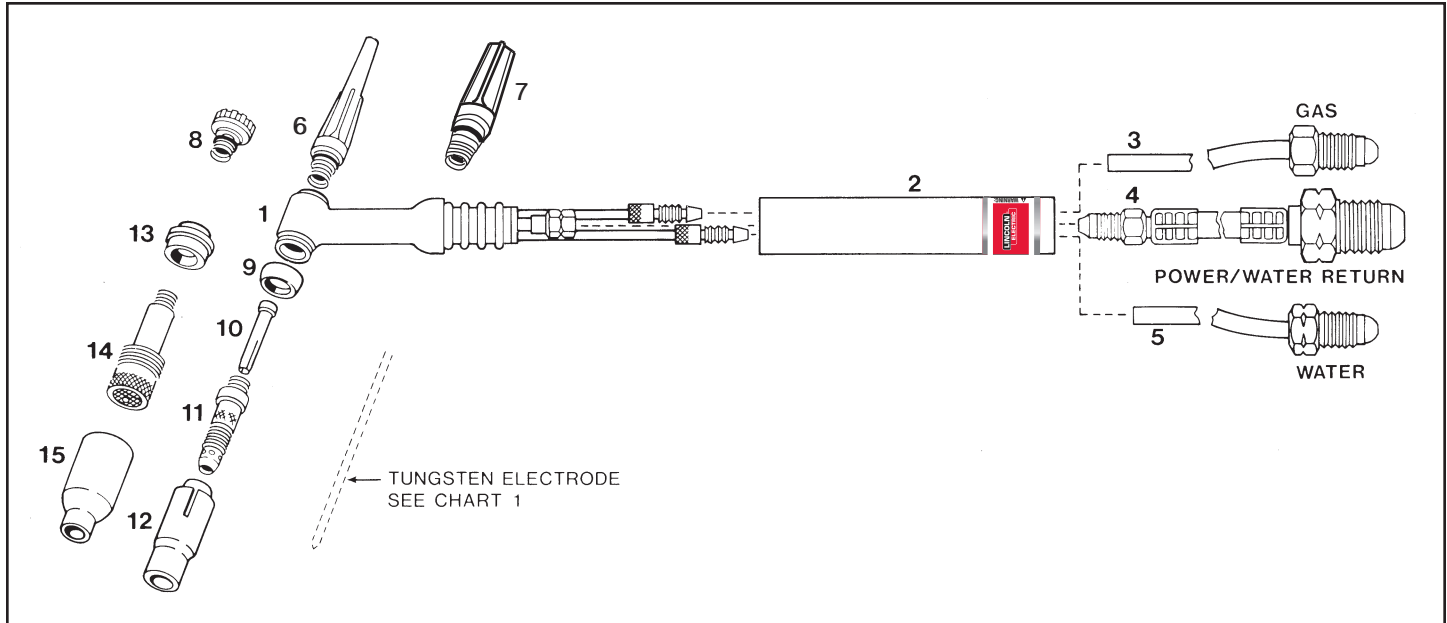
Refer to
<http://www.lincolnelectric.com/safety>
for additional safety information.

TORCH/REPLACEMENT PARTS



Item	Part No.	Industry Reference	Description
1	S19261-1	—	Torch body with gaskets, PTW-18
2	S19511-2	—	Torch handle, PTW-18
3	S19512-17	40V75R	Braided Gas hose, 12 1/2' (3.8m)
3	S19512-20	41V30R	Braided Gas hose, 25' (7.6m)
4	S19512-15	40V64BR	Braided Power cable, 12 1/2' (3.8m)
4	S19512-18	41V29BR	Braided Power cable, 25' (7.6m)
5	S19512-16	40V74R	Braided Water hose, 12 1/2' (3.8m)
5	S19512-19	41V32R	Braided Water hose, 25' (7.6m)
6	PART OF KP504	45V11	Power cable adapter, PTW-18
7	KP2036-1B1	57Y02	Back cap, long, with "O" ring
8	KP2036-2B1	57Y04	Back cap, short, with "O" ring
9	S19515-7	18CG	Cup gasket
10	See Chart 2		Collet
11	See Chart 2		Collet body
12	See Chart 3		Alumina nozzle
13	S19515-8	54N01	Gas lens insulator
14	See Chart 2		Collet body gas lens
15	See Chart 3		Alumina nozzle gas lens

TORCH/REPLACEMENT PARTS



Item	Part No.	Industry Reference	Description
1	S29931-10	---	Torch Body
2	S29931-11	---	Torch Handle
3	S29931-8	---	Gas Super-flex Hose
4	S29931-7	---	Power Super-Flex Hose
5	S29931-9	---	Water In Super-Flex Hose
6	KP2036-1B1	57Y02	Back Cap, Long, With "O" Ring
7	---	34015	Back Cap, Medium, With "O" Ring
8	KP2036-2B1	57Y04	Back Cap, Short, With "O" Ring
9	S29931-12	---	Heat Shield
10	See Chart 2		Collet
11	See Chart 2		Collet body
12	See Chart 3		Alumina nozzle
13	S19515-8	54N01	Gas lens insulator
14	See Chart 2		Collet body gas lens
15	See Chart 3		Alumina nozzle gas lens

CHART 1 – Select tungsten diameter and alumina nozzle based on current and application.

TYPICAL CURRENT RANGES FOR TUNGSTEN ELECTRODES ⁽¹⁾

Tungsten Electrode Diameter in. (mm)	DCEN (-)	AC				Alumina Nozzle Size
		Balanced Wave		Unbalanced Wave		
	Pure and Al- loyed Tungsten	Pure Tungsten	Tungsten Alloys	Pure Tung- sten	Tungsten Alloys	
0.020 (0.5)	5 - 20	10 - 20	5 - 20	5 - 15	5 - 20	4, 5, 6
0.040 (1.0)	15 - 80	20 - 30	20 - 60	10 - 60	15 - 80	4, 5, 6
1/16 (1.6)	70 - 150	30 - 80	60 -120	50 -100	70 -150	5, 6
3/32 (2.4)	150 - 250	60 -130	100 -180	100 -160	140 -235	6, 7, 8
1/8 (3.2)	250 - 400	100 -180	160 -250	150 -210	225 -325	6, 7, 8
5/32 (4.0)	400 - 500	160 -240	200 -320	200 -275	300 -400	8, 10

⁽¹⁾ With argon gas.

CHART 2 – Select Collet/Collet body or Gas Lens Collet body (requires insulator) based on tungsten diameter and application.

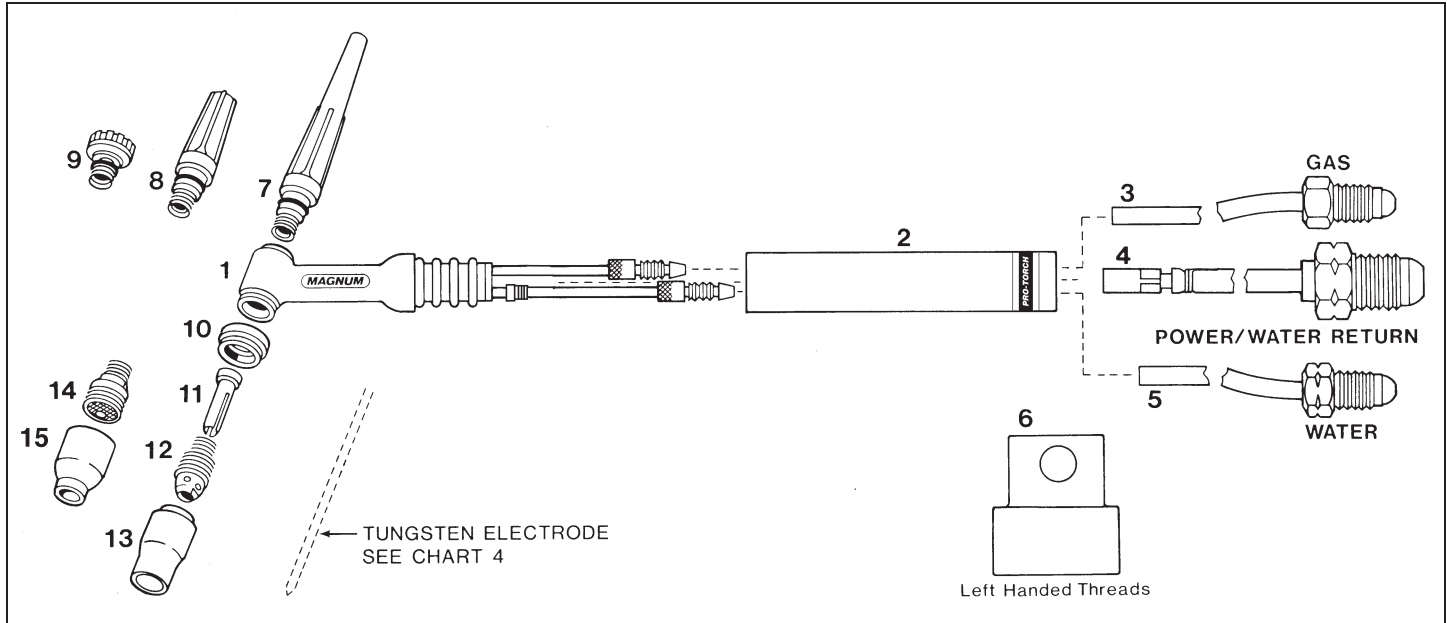
Tungsten Electrode Diameter in. (mm)	Collet Part No. (Industry Ref.)	Collet Body Part No. (Industry Ref.)	Gas Lens Collet Body Part No. (Industry Ref.)
0.020 (0.5)	KP2030-1B1 (10N21)	KP2032-1B1 (10N29)	KP2034-1B1 (45V29)
0.040 (1.0)	KP2030-2B1 (10N22)	KP2032-2B1 (10N30)	KP2034-2B1 (45V24)
1/16 (1.6)	KP2030-3B1 (10N23)	KP2032-3B1 (10N31)	KP2034-3B1 (45V25)
3/32 (2.4)	KP2030-4B1 (10N24)	KP2032-4B1 (10N32)	KP2034-4B1 (45V26)
1/8 (3.2)	KP2030-5B1 (10N25)	KP2032-5B1 (10N28)	KP2034-5B1 (45V27)
5/32 (4.0)	KP2030-6B1 (54N20)	KP2032-6B1 (406488)	KP2034-6B1 (45V28)

CHART 3 (Alumina Gas Nozzle) – Select alumina gas nozzle orifice size based on application.
Standard gas nozzle, 1-27/32" (46.8mm) long, or gas lens,
1-5/8" (41.2mm) long.

Nozzle Orifice Diameter in. (mm)	Size (16th of an inch)	Standard Nozzle Part No. (Industry Ref.)	Gas Lens Part No. (Industry Ref.)
1/4 (6)	4	KP2016-6B1 (10N50)	KP2018-5B1 (54N18)
5/16 (8)	5	KP2016-5B1 (10N49)	KP2018-4B1 (54N17)
3/8 (10)	6	KP2016-4B1 (10N48)	KP2018-3B1 (54N16)
7/16 (11)	7	KP2016-3B1 (10N47)	KP2018-2B1 (54N15)
1/2 (12.5)	8	KP2016-2B1 (10N46)	KP2018-1B1 (54N14)
5/8 (16)	10	KP2016-1B1 (10N45)	—
11/16 (17)	Short	—	KP2018-6B1 ⁽¹⁾

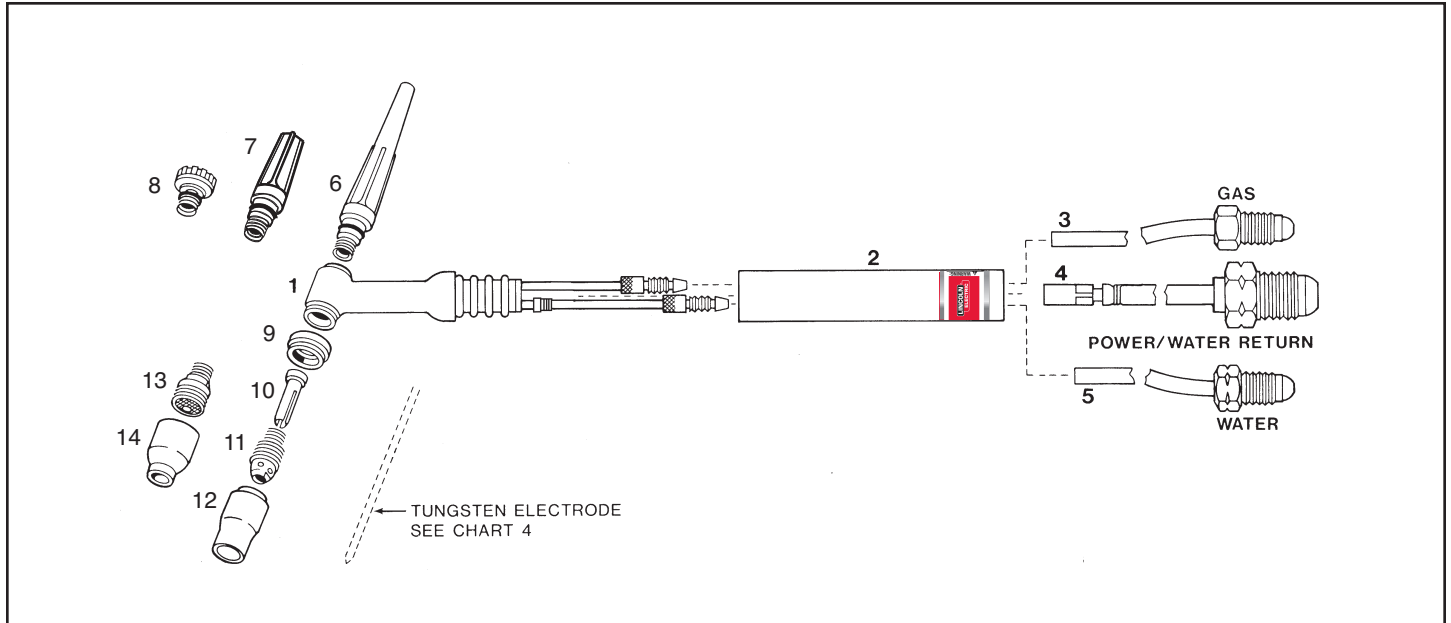
⁽¹⁾ Not recommended for use with high frequency current.

TORCH/REPLACEMENT PARTS



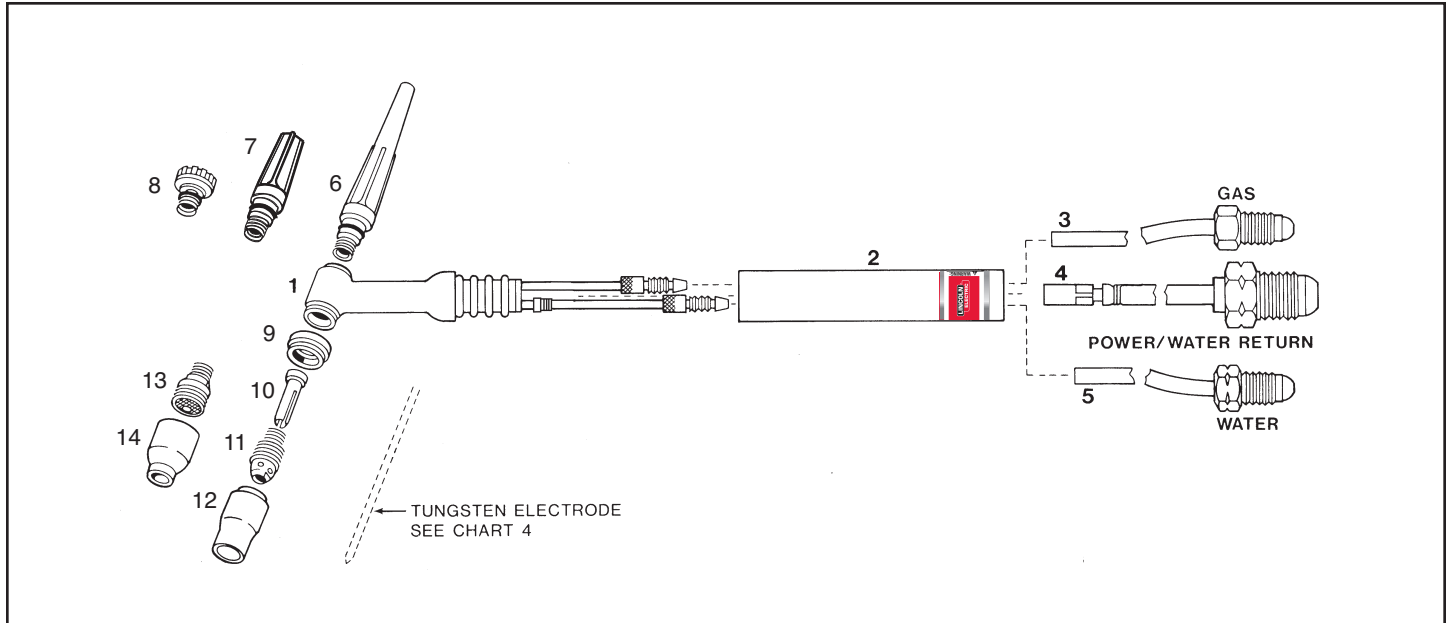
Item	Part No.	Industry Reference	Description
1	S19262-1	—	Torch body with gaskets, PTW-20
2	S19511-1	—	Torch handle, PTW-20
3	S19512-11	45V09R	Braided Gas hose, 12 1/2' (3.8m)
3	S19512-14	45V10R	Braided Gas hose, 25' (7.6m)
4	S19512-9	45V03R	Braided Power cable, 12 1/2' (3.8m)
4	S19512-12	45V04R	Braided Power cable, 25' (7.6m)
5	S19512-10	45V07RM	Braided Water hose, 12 1/2' (3.8m)
5	S19512-13	45V08RM	Braided Water hose, 25' (7.6m)
6	PART OF KP504	45V11	Power cable adapter, PTW-20
7	KP2035-4B1	41V24	Back cap, long, with "O" ring
8	KP2035-2B1	41V35	Back cap, medium, with "O" ring
9	KP2035-1B1	41V33	Back cap, short, with "O" ring
10	S19515-6	598882	Cup gasket
11	See Chart 5	—	Collet
12	See Chart 5	—	Collet body
13	See Chart 6	—	Alumina nozzle
14	See Chart 5	—	Collet body gas lens
15	See Chart 6	—	Alumina nozzle gas lens

TORCH/REPLACEMENT PARTS



Item	Part No.	Industry Reference	Description
1	S29931-4	---	Torch Body
2	S29931-5	---	Torch Handle
3	S29931-2	---	Gas Super-flex Hose
4	S29931-1	---	Power Super-Flex Hose
5	S29931-3	---	Water In Super-Flex Hose
6	KP2035-4B1	41V24	Back Cap, Long, With "O" Ring
7	KP2035-2B1	41V35	Back Cap, Medium, With "O" Ring
8	KP2035-1B1	41V33	Back Cap, Short, With "O" Ring
9	S29931-6	---	Heat Shield
10	See Chart 5	---	Collet
11	See Chart 5	---	Collet Body
12	See Chart 6	---	Alumina Nozzle
13	See Chart 5	---	Collet Body Gas Lens
14	See Chart 6	---	Alumina Nozzle Gas Lens

TORCH/REPLACEMENT PARTS



Item	Part No.	Industry Reference	Description
1	S29931-13	---	Torch Body
2	S29931-14	---	Torch Handle
3	S29931-2	---	Gas Super-flex Hose
4	S29931-7	---	Power Super-Flex Hose
5	S29931-3	---	Water In Super-Flex Hose
6	KP2035-4B1	41V24	Back Cap, Long, With "O" Ring
7	KP2035-2B1	41V35	Back Cap, Medium, With "O" Ring
8	KP2035-1B1	41V33	Back Cap, Short, With "O" Ring
9	S29931-6	---	Heat Shield
10	See Chart 5	---	Collet
11	See Chart 5	---	Collet Body
12	See Chart 6	---	Alumina Nozzle
13	See Chart 5	---	Collet Body Gas Lens
14	See Chart 6	---	Alumina Nozzle Gas Lens

CHART 4 – Select tungsten diameter and alumina nozzle based on current and application.

TYPICAL CURRENT RANGES FOR TUNGSTEN ELECTRODES ⁽¹⁾

Tungsten Electrode Diameter in. (mm)	DCEN (-)	AC				
		Balanced Wave		Unbalanced Wave		
		Pure Tungsten	Tungsten Alloys	Pure Tung- sten	Tungsten Alloys	Alumina Nozzle Size
0.020 (0.5)	5 - 20	10 - 20	5 - 20	5 - 15	5 - 20	4, 5, 6
0.040 (1.0)	15 - 80	20 - 30	20 - 60	10 - 60	15 - 80	4, 5, 6
1/16 (1.6)	70 - 150	30 - 80	60 -120	50 -100	70 -150	5, 6
3/32 (2.4)	150 - 250	60 -130	100 -180	100 -160	140 -235	6, 7, 8
1/8 (3.2)	250 - 400	100 -180	160 -250	150 -210	225 -325	6, 7, 8

⁽¹⁾ With argon gas.

CHART 5 – Select Collet/Collet body or Gas Lens Collet body (requires insulator) based on tungsten diameter and application.

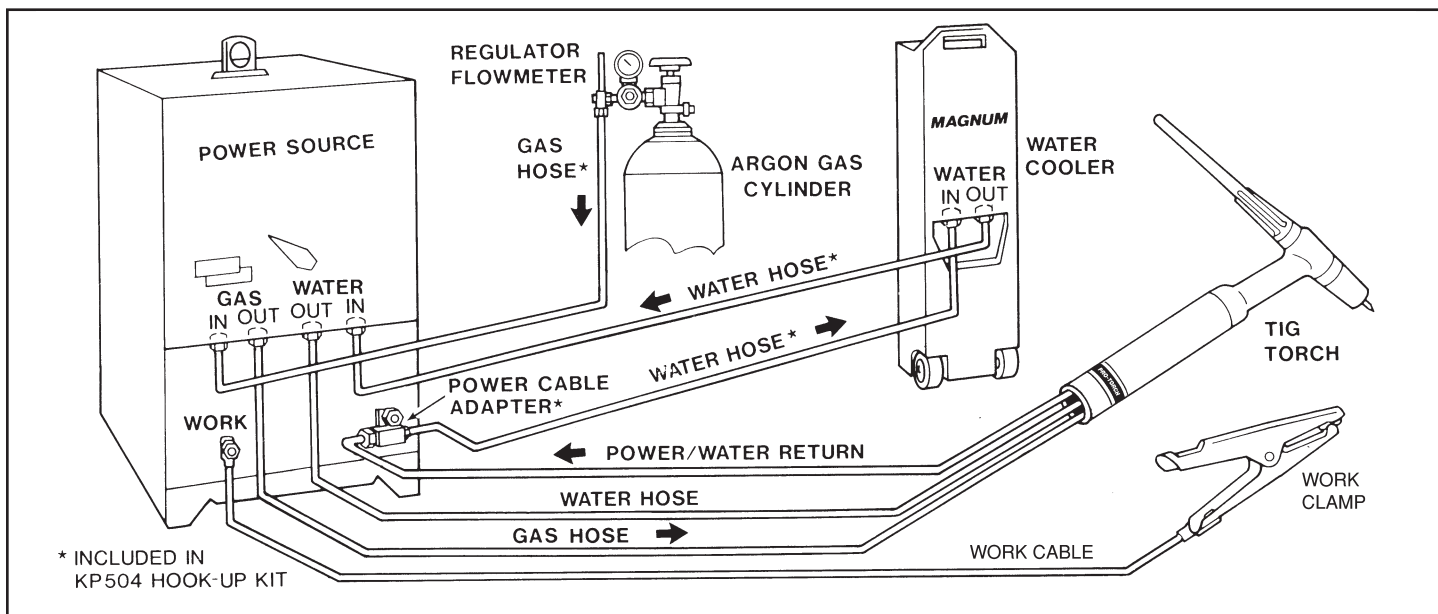
Tungsten Electrode Diameter in. (mm)	Collet Part No. (Industry Ref.)	Collet Body Part No. (Industry Ref.)	Gas Lens Collet Body Part No. (Industry Ref.)
0.020 (0.5)	KP2029-1B1 (13N20)	KP2031-1B1 (13N25)	KP2033-1B1 (45V41)
0.040 (1.0)	KP2029-2B1 (13N21)	KP2031-2B1 (13N26)	KP2033-2B1 (45V42)
1/16 (1.6)	KP2029-3B1 (13N22)	KP2031-3B1 (13N27)	KP2033-3B1 (45V43)
3/32 (2.4)	KP2029-4B1 (13N23)	KP2031-4B1 (13N28)	KP2033-4B1 (45V44)
1/8 (3.2)	KP2029-5B1 (13N24)	KP2031-5B1 (13N29)	KP2033-5B1 (45V45)

CHART 6 (Alumina Gas Nozzle) – Select alumina gas nozzle orifice size based on application.
Standard gas nozzle, 1-5/32" (29.3mm) long, or gas lens,
1" (25.4mm) long.

Nozzle Orifice Diameter in. (mm)	Size (16th of an inch)	Standard Nozzle Part No. (Industry Ref.)	Gas Lens Part No. (Industry Ref.)
1/4 (6)	4	KP2017-1B1 (13N08)	KP2019-1B1 (53N58)
5/16 (8)	5	KP2017-2B1 (13N09)	KP2019-2B1 (53N59)
3/8 (10)	6	KP2017-3B1 (13N10)	KP2019-3B1 (53N60)
7/16 (11)	7	KP2017-4B1 (13N11)	KP2019-4B1 (53N61)
1/2 (12.5)	8	KP2017-5B1 (13N12)	—
5/8 (16)	10	KP2017-6B1 (13N13)	—

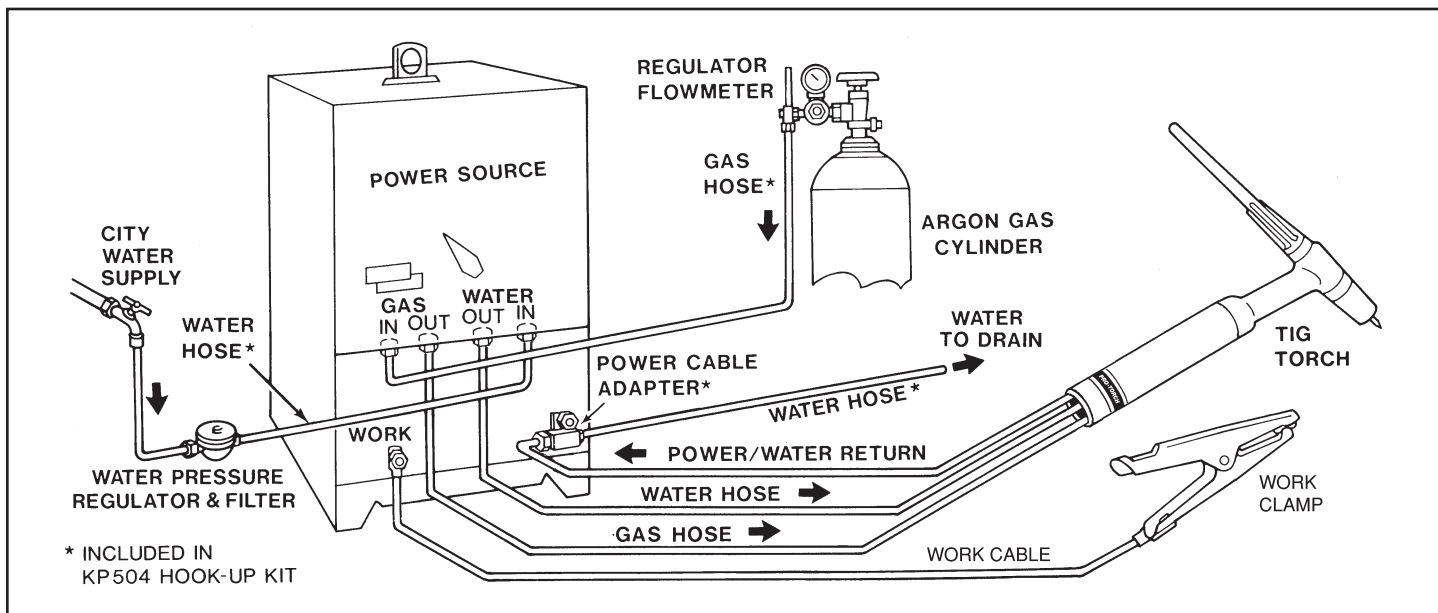
CONNECTION DIAGRAMS

WATER-COOLED TIG TORCH – MAGNUM™ COOLER⁽¹⁾



⁽¹⁾ Magnum Cooler is a unique design to be used with or without a solenoid. Diagram shows connection to power source water solenoid to work as a demand system increasing the pump life. Magnum coolers are part of the Magnum family of products offered by Lincoln Electric.

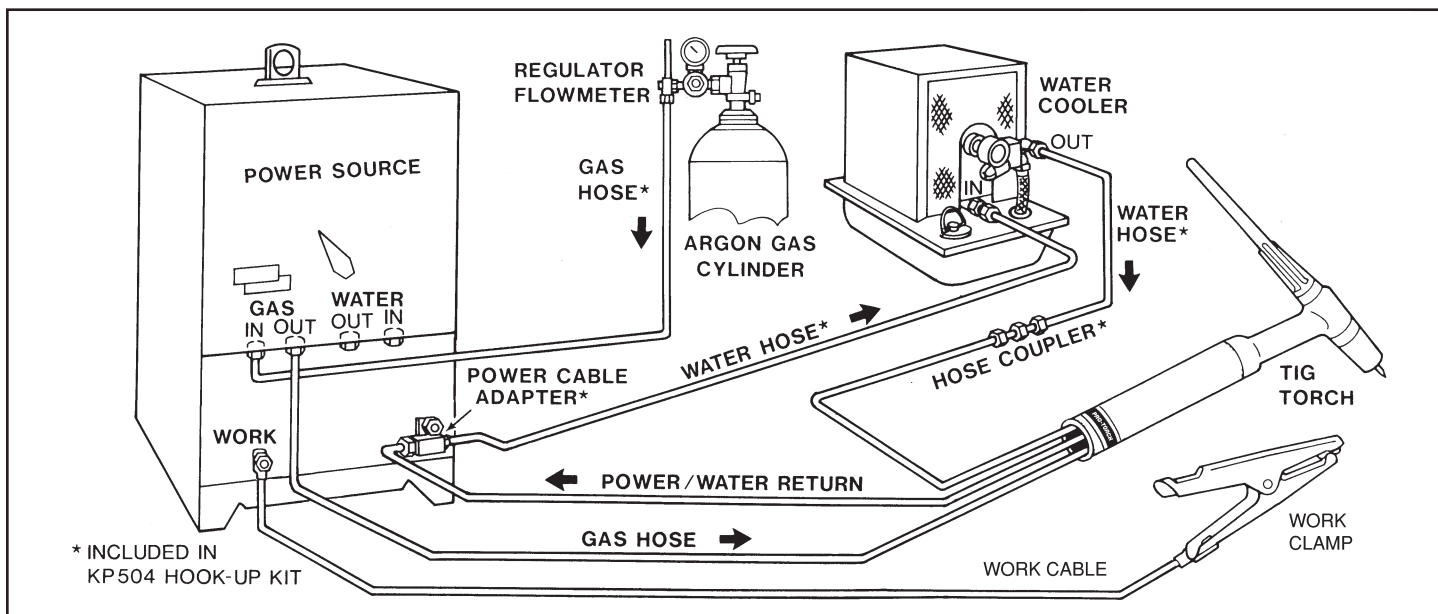
WATER-COOLED TIG TORCH – CITY WATER SUPPLY



Note: Refer to the manufacturer's power source operating manual for recommended installation practice.

CONNECTION DIAGRAMS (continued)

WATER-COOLED TIG TORCH – WATER COOLER⁽¹⁾



⁽¹⁾ Water cooler does not permit use of water solenoid on power source to avoid pump damage.

Note: Refer to the manufacturer's power source operating manual for recommended installation practice.

HOOK-UP KIT – The hook-up kit contains the necessary hoses and accessories to connect between your gas regulator, power source, and water supply. The KP504 hook-up kit is required for proper connection and is ordered separately.

KP504 For PTW-18 and PTW-20

Quantity	Part No. (Industry Ref.)	Description
1	S19257-1 (45V11)	Power cable adapter
2	S19558-4 (40V76)	Water hose, 12-1/2 ft. (3.8m)
1	S19558-6 (11N18)	Water hose coupler
2	S19558-5 —	Water adapter fittings, 5/8" (15.8mm)
1	S19558-1 (40V77)	Gas hose, 12-1/2 ft. (3.8m)

			
WARNING	<ul style="list-style-type: none"> Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	<ul style="list-style-type: none"> Keep flammable materials away. 	<ul style="list-style-type: none"> Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> No toque las partes o los electrodos bajo carga con la piel o ropa mojada. Aislese del trabajo y de la tierra. 	<ul style="list-style-type: none"> Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> Não toque partes elétricas e electrodos com a pele ou roupa molhada. Isole-se da peça e terra. 	<ul style="list-style-type: none"> Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> 燃えやすいものの側での溶接作業は絶対にしてはなりません。 	<ul style="list-style-type: none"> 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> 皮肤或湿衣物切勿接触带电部件及焊条。 使你自己与地面和工件绝缘。 	<ul style="list-style-type: none"> 把一切易燃物品移离工作场所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身体劳动保护用具。
Korean 위험	<ul style="list-style-type: none"> 전도체나 용접봉을 젖은 형갑 또는 피부로 절대 접촉치 마십시오. 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجلد الجسم أو بالملابس المبللة بالماء. ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● أقطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.



THE LINCOLN ELECTRIC COMPANY

22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com