



WORLDWIDE



**THE STANDARD
IN TIG WELDING**

TORCH MANUAL

for CK9, CK20, CK25

2 Series Standard



www.CKWORLDWIDE.com

MADE IN THE U.S.A.

Phone: 1 (800) 426-0877

FORM TM-2 MARCH 2017

Congratulations on your purchase of a CK Worldwide TIG Torch!

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Product demonstrations,
welding tips and more.



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The information in this manual represents the best judgement of CK Worldwide, Inc. and is intended for use by experienced personnel. Never operate any equipment without carefully reading, understanding, and following all of the related safety rules and practices. CK Worldwide makes no claims, expressed or implied, as to the viability of this information for any application or use. The individual user is solely responsible for any and all uses of the information contained herein, since CK Worldwide has no means to confirm the correct use of, or control any of the variables to the use of any and all information herein.

IN THIS MANUAL

you will find technical and ordering information for CK9, CK20, and CK25 TIG torches, hoses, and accessories.

TORCH SPECIFICATIONS

CK9



CK20/CK25*



INSTALLATION: Before using this torch, tighten regulator, hose and power cable fittings with proper wrenches. Using small pliers, securely tighten all knurled hose fittings (Slide the torch handle back for access to the torch connections). Purge the regulator and TIG torch with inert gas at 20 cubic feet per hour. Following these steps will ensure contamination free welds. Repeat this procedure whenever torch or regulator fittings have been detached.

MAX-FLO

Improved Cooling Capacity



4X Cooling Surface Area



Competitor's Torch

*CK25 (Pencil) uses same thread pattern as the CK20

WARRANTY: CK Worldwide, Inc. warrants products manufactured by CK Worldwide, Inc. to be free of defects in materials and workmanship. CK Worldwide, Inc. limits this warranty to replacement of the product or parts thereof and excludes liability for injury, property damage or economic loss attributable to product use or misuse. In any event, CK Worldwide, Inc. will only be responsible for its products when used with accessory items manufactured by CK Worldwide, Inc.

CALIFORNIA PROPOSITION 65

WARNING: This product contains or produces a chemical known to the state of California to cause cancer and birth defects or other reproductive harm) (California Health and Safety Code Section 25249.5 et seq.)

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer (California Health and Safety Code Section 25249.5 et seq.)

INFORMATION SOURCES

California Health and Safety Code, Section 25249.4 through 25249.13. The California Office of Environmental Health Hazard Assessment, 301 Capitol Mall, Sacramento, CA 95814; Telephone 916-445-6900.
California Proposition 65 Website: www.oehha.ca.gov/prop65.html.
American National Standards Institute (ANSI). Product Safety Signs And Labels (ANSI Z535.4), available from ANSI, 25 West 43rd Street, New York, NY 10036; Telephone 212-642-4900; Website www.ansi.org.

SAFETY INFORMATION

Welding and cutting equipment can be dangerous to both the operator and people in or near the surrounding working area, if the equipment is not correctly operated. Equipment must only be used under the strict and comprehensive observance of all relevant safety regulations. Read and understand this instruction manual carefully before the installation and operation of this equipment.



ELECTRIC SHOCK:
It can kill



FUMES AND GASES ARE DANGEROUS



ARC RAYS: Harmful to people's eyes and skin



ELECTRIC SHOCK: It can kill. Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and internal machine circuits are also live when power is on. Incorrectly installed or improperly grounded equipment is dangerous.

- Connect the primary input cable according to American standards and regulations. ANSI Z49.1.
- Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. The operator must wear dry welding gloves while he/she performs the welding task.
- The operator should keep the work piece insulated from himself/herself.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cable for wear and tear, replace the cable immediately if damaged, bare wiring is dangerous and can kill.
- Do not use damaged, under-sized, or badly joined cables.
- Do not drape cables over your body.

FUMES AND GASES ARE DANGEROUS: Smoke and gas generated while welding or cutting can be harmful to people's health. Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Do not breathe the smoke and gas generated while welding or cutting, keep your head out of the fumes.
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be certain the air in your work environment is safe to breathe.
- Do not weld 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.
- Materials such as galvanized, lead, or cadmium plated steel, contain elements that can give off toxic fumes when welded. Do not weld these materials unless the area is very well ventilated, and or wearing an air supplied respirator.

ARC RAYS: Harmful to people's eyes and skin. Arc rays from the welding process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Always wear a welding helmet with correct shade of filter lens and suitable protective clothing including welding gloves while the welding operation is performed.
- Measures should be taken to protect people in or near the surrounding working area. Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.

HOT PARTS: Items being welded generate and hold high heat and can cause severe burns. Do not touch hot parts with bare hands. Allow a cooling period before working on the welding gun. Use insulated welding gloves and clothing to handle hot parts and prevent burns.

FIRE HAZARD: Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode. Flying sparks from the welding arc, hot work piece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Welding sparks may cause fire, therefore remove any flammable materials away from the working area, at least 40 feet (12m) from the welding arc. Cover flammable materials and containers with approved covers if unable to be moved from the welding area.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to the required Safety Standards to insure that flammable or toxic vapors and substances are totally removed, these can cause an explosion even though the vessel has been “cleaned.” Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors such as gasoline.
- Have a fire extinguisher nearby and know how to use it. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.

GAS CYLINDERS: Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Because gas cylinders are normally part of the welding process, be sure to treat them carefully. **CYLINDERS** can explode if damaged.

- Protect gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Insure cylinders are held secure and upright to prevent tipping or falling over.
- Never allow the welding electrode or earth clamp to touch the gas cylinder, do not drape welding cables over the cylinder.
- Never weld on a pressurized gas cylinder, it will explode and kill you.
- Open the cylinder valve slowly and turn your face away from the cylinder outlet valve and gas regulator.

GAS BUILD UP: The build up of gas can cause a toxic environment by depleting the air's oxygen content and potentially resulting in injury or death.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRONIC MAGNETIC FIELDS: **MAGNETIC FIELDS** can affect implanted medical devices.

- Wearers of pacemakers and other implanted medical devices should keep away.
- Implanted medical device wearers should consult their doctor and the device manufacturer before going near any electric welding, cutting or heating operation.

NOISE CAN DAMAGE HEARING: Noise from some processes or equipment can damage hearing. Wear approved ear protection if noise level is high.



FIRE HAZARD



GAS CYLINDERS
Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode



GAS BUILD UP



ELECTRONIC MAGNETIC FIELDS can affect implanted medical devices



NOISE CAN DAMAGE HEARING

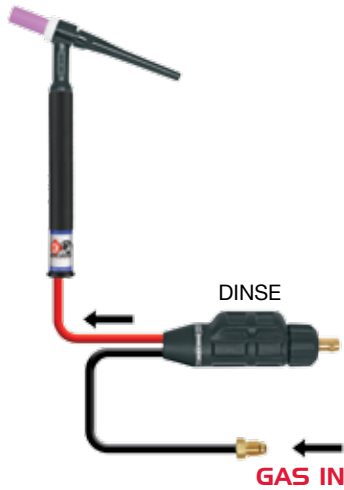
CONNECTION DIAGRAMS

GAS-COOLED

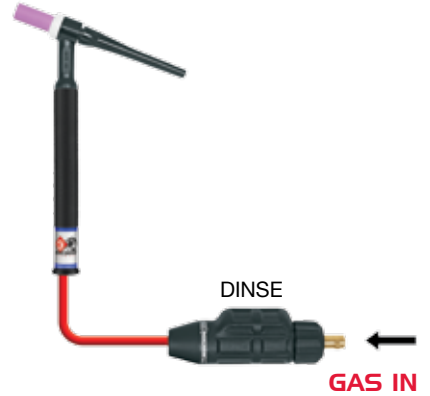
2 PIECE



1 PIECE

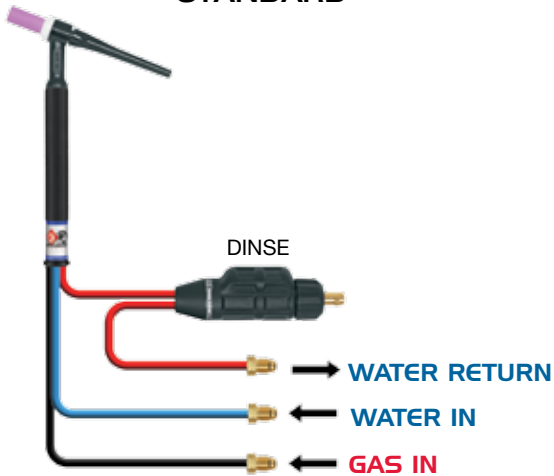


1 PIECE GAS-THRU

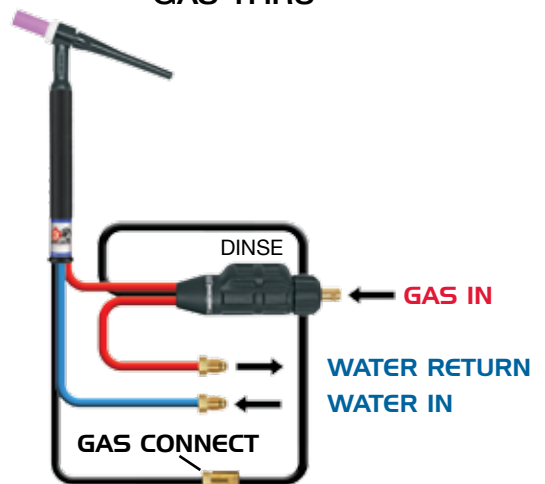


WATER-COOLED

STANDARD

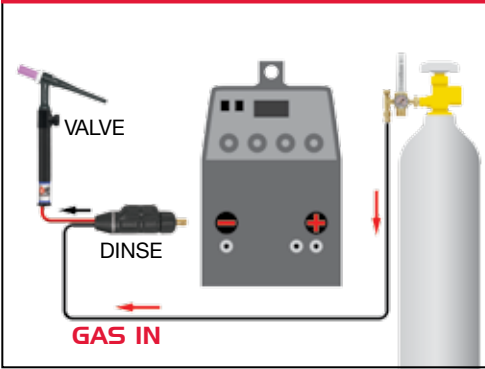


GAS-THRU

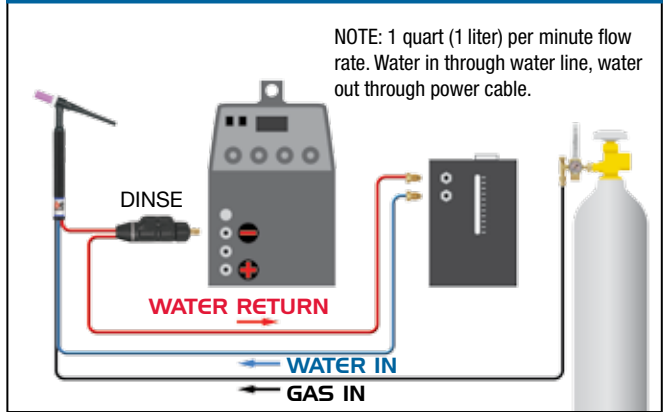


MACHINE CONNECTION DIAGRAMS

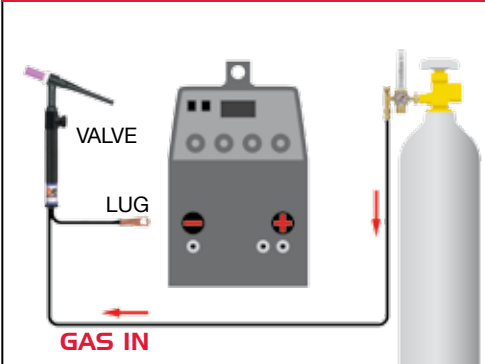
1 PIECE GAS-COOLED



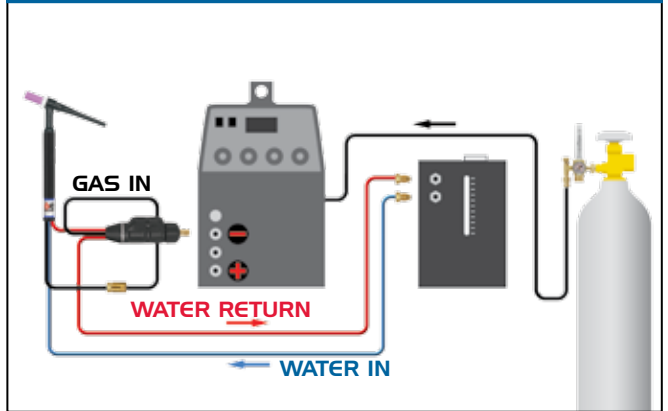
WATER-COOLED



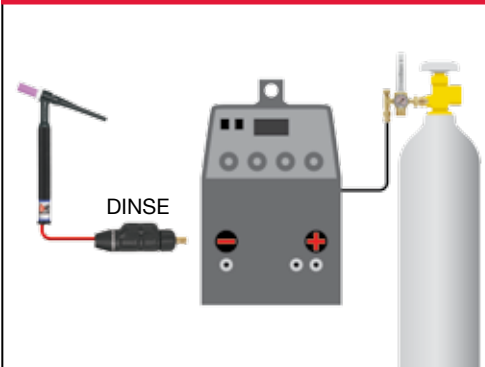
2 PIECE GAS-COOLED



WATER-COOLED GAS-THRU

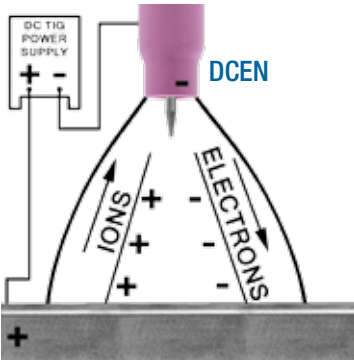


1 PIECE GAS-THRU



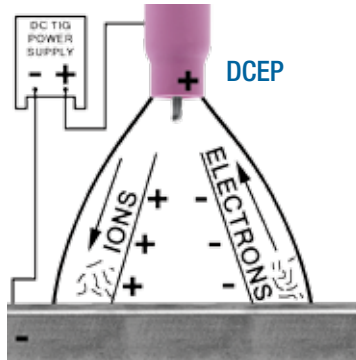
CHARACTERISTICS OF CURRENT TYPES

FOR GAS TUNGSTEN ARC WELDING When TIG welding, there are three choices of welding current. They are: Direct Current Straight Polarity (DCSP), Direct Current Reverse Polarity (DCRP), and Alternating Current with or without High Frequency stabilization (ACHF). Each of these has its applications, advantages, and disadvantages. A look at each type and its uses will help the operator select the best current type for the job. The type of current used will have a great effect on the penetration pattern as well as the bead configuration. The diagrams below show arc characteristics of each current polarity type.



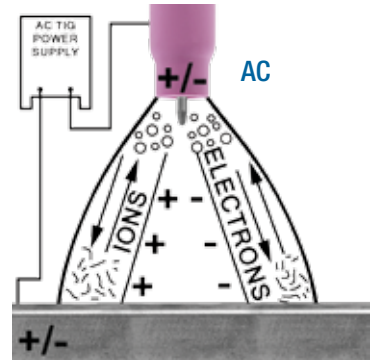
TIG WELDING DCSP

Direct Current Straight Polarity produces deep penetration by concentrating heat in the joint area. No cleaning action occurs with this polarity.



TIG WELDING DCRP

Direct Current Reverse Polarity produces the best cleaning action as the argon ions flowing towards the work strike with sufficient force to break up oxides on the surface.



TIG WELDING WITH ACHF

Alternating Current High Frequency combines the weld penetration on the negative half cycle with the cleaning action of the positive half cycle. High frequency re-establishes the arc which breaks each half cycle on transformer based machines.

CURRENT TYPE	DCSP
ELECTRODE POLARITY	Electrode negative
OXIDE CLEANING ACTION	No
HEAT BALANCE IN THE ARC	70% of work end 30% at electrode end
PENETRATION PROFILE	Deep narrow
ELECTRODE CAPACITY	Excellent

CURRENT TYPE	DCRP
ELECTRODE POLARITY	Electrode positive
OXIDE CLEANING ACTION	Yes
HEAT BALANCE IN THE ARC	30% of work end 70% at electrode end
PENETRATION PROFILE	Shallow wide
ELECTRODE CAPACITY	Poor

CURRENT TYPE	ACHF
ELECTRODE POLARITY	Alternating
OXIDE CLEANING ACTION	Yes (once every half cycle)
HEAT BALANCE IN THE ARC	50% of work end 50% at electrode end
PENETRATION PROFILE	Medium
ELECTRODE CAPACITY	Good

DCSP mainly used on: Stainless Steel, Mild Steel, Nickel, Copper, Titanium

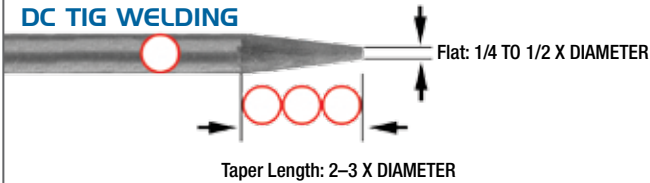
ACHF mainly used on: Aluminum, Magnesium

DCRP mainly used on: Thin Material

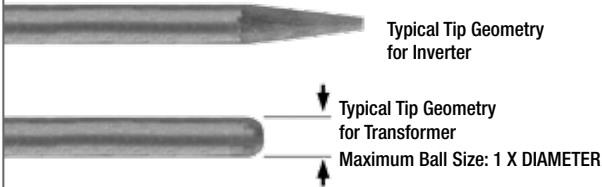
TUNGSTEN GRINDING/PREPARATION

TUNGSTEN TIP PREPARATION

DC TIG WELDING



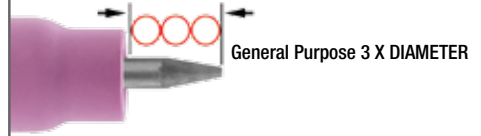
AC TIG WELDING



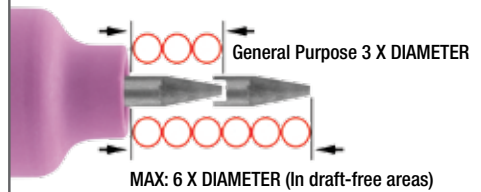
Ball tip by arcing on non-ferrous metal at low current DCRP (EP) then slowly increase current to form the desired ball diameter. Return setting to AC.

TUNGSTEN EXTENSION

STANDARD PARTS



GAS LENS PARTS



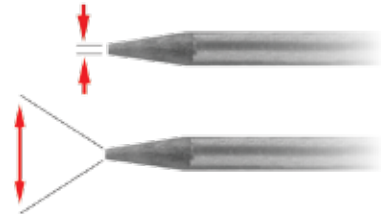
TUNGSTEN GRINDING



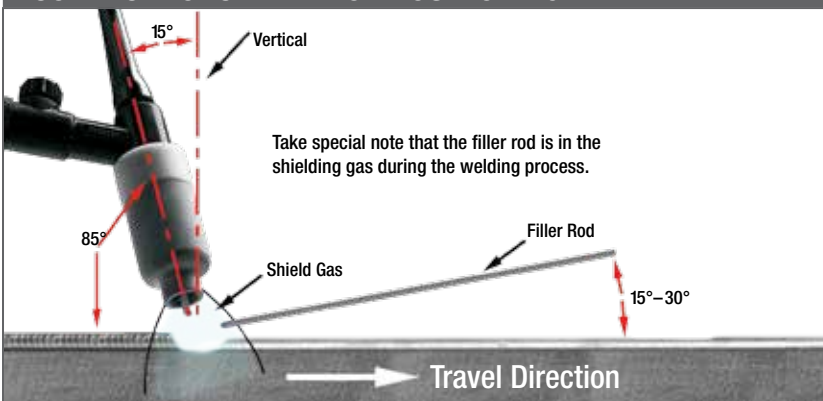
Use a medium (60 grit or finer)

- Grind longitudinally (never radially)
- Truncate (blunt) end
- Diameter of flat spot determines amperage capacity






















The included angle determines weld bead shape and size. Generally, as the included angle increases, penetration increases and bead width decreases.



CORRECT TORCH AND ROD POSITIONING










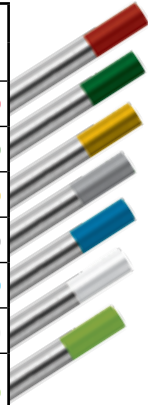
WELD PENETRATION PROFILES

<p>Gas Type</p>	 <p>30° Angle .005" FLAT</p>	 <p>60° Angle .010" FLAT</p>	 <p>90° Angle .020" FLAT</p>
<p>100Ar 100% Argon</p>			
<p>75Ar-25He 75% Argon 25% Helium</p>			
<p>50Ar-50He 50% Argon 50% Helium</p>			
<p>25Ar-75He 25% Argon 75% Helium</p>			
<p>100He 100% Helium</p>			
<p>95Ar-5H₂ 95% Argon 5% Hydrogen</p>			

TUNGSTEN COLOR CODES & ALLOYING ELEMENTS

COLOR CODE FOR TUNGSTEN ELECTRODES

Designation		Chemical Composition Impurities ≤ 0.1%		TIP COLOR	
ISO 6848	AWS A5.12	OXIDE ADDITIVE	TUNGSTEN		
WT20	EWTh-2	ThO ₂ : 1.70–2.20%	2% THORIATED	Red	
WP	EWP	~~~~~	PURE	Green	
WL15	EWL a-1.5	LaO ₂ : 1.30–1.70%	1.5% LANTHANATED	Gold	
WC20	EWCe-2	CeO ₂ : 1.80–2.20%	2% CERIATED	Gray	
WL20	EWL a-2	La ₂ O ₃ : 1.80–2.20%	2% LANTHANATED	Blue	
WZ8	EWZr-8	ZrO ₂ : 0.70–0.90%	0.8% ZIRCONIATED	White	
LaYZr™	EWG	La ₂ O ₃ : 1.3–1.7%; Y ₂ O ₃ : 0.06–0.10%; ZrO ₂ : 0.6–1.0%	1.5% LANTHANATED 0.8% YTTRIATED 0.8% ZIRCONIATED	Chartreuse	



SELECTING THE CORRECT TORCH NOZZLE

CUP CHART



ALUMINA

High impact resistance
Low thermal shock
(Aluminum Oxide)



CERAMIC

High thermal shock
Low impact resistance
(Lava)



SUPER CUP

High thermal shock
High impact resistance
(Silicon Nitride)



PYREX

High visibility
Low thermal shock
Low impact resistance
(Pyrex)



GUIDE FOR SHIELD GAS FLOWS, CURRENT SETTINGS & CUP SELECTION






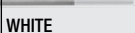

Electrode Diameter	Cup Size	WELDING CURRENT (AMPS)				TUNGSTEN TYPE		ARGON FLOW FERROUS METALS		ARGON FLOW ALUMINUM	
		AC Pure	AC Thoriated	DCSP Pure	DCSP Thoriated	Standard Body CFH (L/MN)	Gas Lens Body CFH (L/MN)	Standard Body CFH (L/MN)	Gas Lens Body CFH (L/MN)		
.020" (0.5mm)	3, 4, or 5	5-15	5-20	5-15	5-20	5-8 (3-4)	5-8 (3-4)	5-8 (3-4)	5-8 (3-4)		
.040" (1.0mm)	4 or 5	10-60	15-80	15-70	20-80	5-10 (3-5)	5-8 (3-4)	5-12 (3-6)	5-10 (3-5)		
1/16" (1.6mm)	4, 5, or 6	50-100	70-150	70-130	80-150	7-12 (4-6)	5-10 (3-5)	8-15 (4-7)	7-12 (4-6)		
3/32" (2.4mm)	6, 7, or 8	100-160	140-235	150-220	150-250	10-15 (5-7)	8-10 (4-5)	10-20 (5-10)	10-15 (5-7)		
1/8" (3.2mm)	7, 8, or 10	150-210	220-325	220-330	240-350	10-18 (5-9)	8-12 (4-6)	12-25 (6-12)	10-20 (5-10)		
5/32" (4.0mm)	8 or 10	200-275	300-425	375-475	400-500	15-25 (7-12)	10-15 (5-7)	15-30 (7-14)	12-25 (6-12)		
3/16" (4.8mm)	8 or 10	250-350	400-525	475-800	475-800	20-35 (10-17)	12-25 (6-12)	25-40 (12-19)	15-30 (7-14)		
1/4" (6.4mm)	10	325-700	500-700	750-1000	700-1000	25-50 (12-24)	20-35 (10-17)	30-55 (14-26)	25-45 (12-21)		

For pure helium shielding gas, double flow rates shown. For argon-helium mixes with below 30% helium content, use figures shown. Always adjust gas flows to accommodate best shielding results.

TUNGSTEN ELECTRODE TIP SHAPES & CURRENT RANGES





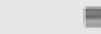
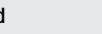


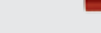

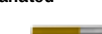

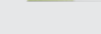
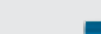
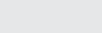


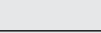
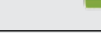
ELECTRODE DIAMETER		DIAMETER AT TIP		INCLUDED ANGLE	CURRENT RANGE	PULSED CURRENT RANGE
Millimeters	Inches	Millimeters	Inches			
1.0mm	.040"	.125mm	.005"	12°	2-15 amps	2-25 amps
1.0mm	.040"	.250mm	.010"	20°	5-30 amps	5-60 amps
1.6mm	1/16"	.500mm	.020"	25°	8-50 amps	8-100 amps
1.6mm	1/16"	.800mm	.030"	30°	10-70 amps	10-140 amps
2.4mm	3/32"	.800mm	.030"	35°	12-90 amps	12-180 amps
2.4mm	3/32"	1.100mm	.045"	45°	15-150 amps	15-250 amps
3.2mm	1/8"	1.100mm	.045"	60°	20-200 amps	20-300 amps
3.2mm	1/8"	1.500mm	.060"	90°	25-250 amps	25-350 amps

TUNGSTEN ELECTRODE CHARACTERISTICS

Tungsten	Color Code	Characteristics
Pure	 GREEN	Provides good arc stability for AC welding. Reasonably good resistance to contamination. Lowest current carrying capacity. Least expensive. Maintains a balled end. Used on transformer based machines only.
2% Ceriated	 GRAY	Similar performance to thoriated tungsten. Easy arc starting, good arc stability, long life. Possible replacement for thoriated.
2% Thoriated	 RED	Easier arc starting. Higher current capacity. Greater arc stability. High resistance to weld pool contamination. Difficult to maintain balled end on AC.
1.5% Lanthanated	 GOLD	Similar performance to thoriated tungsten. Easy arc starting, good arc stability, long life, high current capacity. 1.5% possible replacement for thoriated. 2% possible replacement for Pure.
2% Lanthanated	 BLUE	Similar performance to thoriated tungsten. Easy arc starting, good arc stability, long life, high current capacity. 1.5% possible replacement for thoriated. 2% possible replacement for Pure.
.8% Zirconiated	 WHITE	Excellent for AC welding due to favorable retention of balled end, high resistance to contamination, and good arc starting. Preferred when tungsten contamination of weld is intolerable. Possible replacement for Pure.
LaYZr™	 CHARTREUSE*	Best for use on automated or robotic applications. Runs cooler than 2% Thoriated with longer life. Low to medium amperage range.

*Substitute for Purple (Same oxide blend).

TUNGSTEN ELECTRODE CURRENT RANGES

Tungsten Diameter in inches (mm)	Gas Cup (Inside Diameter)	TYPICAL CURRENT RANGE				
		Direct Current, DC	Alternating Current, AC			
		DCEN	70% Penetration		(50/50) Balanced Wave, AC	
		Ceriated	Zirconiated	Ceriated	Zirconiated	Ceriated
						
						
						
						
.040" (1.0mm)	#6 (3/8")	15–80 amps	20–60 amps	15–80 amps	10–30 amps	20–60 amps
1/16" (1.6mm)	#6 (3/8")	70–150 amps	50–100 amps	70–150 amps	30–80 amps	60–120 amps
3/32" (2.3mm)	#8 (1/2")	150–250 amps	100–160 amps	140–235 amps	60–130 amps	100–180 amps
1/8" (3.2mm)	#8 (1/2")	250–400 amps	150–200 amps	225–325 amps	100–180 amps	160–250 amps

All values are based on the use of Argon as a shielding gas. Other current values may be employed depending on the shielding gas, type of equipment, and application. DCEN = Direct Current Electrode Negative (Straight Polarity)

TYPICAL MANUAL TIG WELDING PARAMETERS

ALUMINUM (ACHF)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	1/16" (1.6mm)	4, 5, 6	ARGON	15 (7)	20	60-80	12" (307.2mm)
	FILLET							70-90	10" (256mm)
1/8" (3.2mm)	BUTT	3/32" (2.4mm)	3/32" (2.4mm)	6, 7	ARGON	17 (8)	20	125-145	12" (307.2mm)
	FILLET		1/8" (3.2mm)					3/32" (2.4mm)	140-160
3/16" (4.8mm)	BUTT	1/8" (3.2mm)	1/8" (3.2mm)	7, 8	ARGON/ HELIUM	21 (10)	20	195-220	11" (258.6mm)
	FILLET							210-240	9" (230.4mm)
1/4" (6.4mm)	BUTT	3/16" (4.8mm)	1/8" (3.2mm)	8, 10	ARGON/ HELIUM	25 (12)	20	260-300	10" (256mm)
	FILLET							280-320	8" (204.8mm)

WELDING ALUMINUM

The use of TIG welding for aluminum has many advantages for both manual and automatic processes. Filler metal can be either wire or rod and should be compatible with the base alloy. Filler metal must be dry, free of oxides, grease, or other foreign matter. If filler metal becomes damp, heat for 2 hours at 250°F (121°C) before using. Although ACHF is recommended, DCRP has been successful up to 3/32" (2.4mm), DCSP with helium shield gas is successful in mechanized applications.

TITANIUM (ACHF)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	NONE	4, 5, 6	ARGON	15 (7)	20	90-110	10" (256mm)
	FILLET							110-150	8" (204.8mm)
1/8" (3.2mm)	BUTT	3/32" (2.4mm)	1/16" (1.6mm)	5, 6, 7	ARGON	15 (7)	20	190-220	9" (230.4mm)
	FILLET							210-250	7" (179.2mm)
3/16" (4.8mm)	BUTT	3/32" (2.4mm)	1/8" (3.2mm)	6, 7, 8	ARGON	20 (10)	20	220-250	8" (204.8mm)
	FILLET							240-280	7" (179.2mm)
1/4" (6.4mm)	BUTT	1/8" (3.2mm)	1/8" (3.2mm)	8, 10	ARGON	35 (15)	20	275-310	8" (204.8mm)
	FILLET							290-340	7" (179.2mm)

WELDING TITANIUM

Small amounts of impurities, particularly oxygen and nitrogen, cause embrittlement of molten or hot titanium when above 500°F (260°C). The molten weld metal in the heat-affected zones must be shielded by a protective blanket of inert gas. Titanium requires a strong, positive pressure of argon or helium as a backup on the root side of the weld, as well as long, trailing, protective tail of argon gas to protect the metal while cooling. Purge chambers and trailing shields are available from CK Worldwide to assist in providing quality results.

MAGNESIUM (ACHF)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	3/32" (2.4mm)	5, 6	ARGON	13 (5)	15	60	20" (512mm)
	FILLET		1/8" (3.2mm)					60	
1/8" (3.2mm)	BUTT	3/32" (2.4mm)	1/8" (3.2mm)	7, 8	ARGON	19 (9)	15	115	17" (435.2mm)
	FILLET		5/32" (4.0mm)					115	
1/4" (6.4mm)	BUTT	3/16" (4.8mm)	5/32" (4.0mm)	8	ARGON	25 (12)	15	100-130	22" (563.2mm)
	FILLET							110-135	20" (512mm)
1/2" (12.8mm)	BUTT	1/4" (6.4mm)	3/16" (4.8mm)	10	ARGON	35 (17)	15	260	10" (256mm)
FILLET									

WELDING MAGNESIUM

Magnesium was one of the first metals to be welded commercially by TIG. Magnesium alloys are in three groups, they are: (1) aluminum-zinc-magnesium, (2) aluminum-magnesium, and (3) manganese-magnesium. Since magnesium absorbs a number of harmful ingredients and oxidizes rapidly when subjected to welding heat, TIG welding in an inert gas atmosphere is distinctly advantageous. The welding of magnesium is similar, in many respects, to the welding of aluminum. Magnesium requires a positive pressure of argon as a backup on the root side of the weld.

TYPICAL MANUAL TIG WELDING PARAMETERS

DEOXIDIZED COPPER (DCSP)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	1/16" (1.6mm)	4, 5, 6	ARGON	18 (9)	15	110–140	12" (307.2mm)
	FILLET							130–150	10" (256mm)
1/8" (3.2mm)	BUTT	3/32" (2.4mm)	3/32" (2.4mm)	4, 5, 6	ARGON	36 (17.5)	15	175–225	11" (258.6mm)
	FILLET							200–250	9" (230.4mm)
3/16" (4.8mm)	BUTT	1/8" (3.2mm)	1/8" (3.2mm)	8, 10	HELIUM	21 (10)	15	190–225	10" (256mm)
	FILLET							205–250	8" (204.8mm)
1/4" (6.4mm)	BUTT (2)	3/16" (4.8mm)	1/8" (3.2mm)	8, 10	HELIUM	25 (12)	15	225–260	9" (230.4mm)
	FILLET							250–280	7" (179.2mm)

STAINLESS STEEL (DCSP)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	1/16" (1.6mm)	4, 5, 6	ARGON	11 (5.5)	20	80–100	12" (307.2mm)
	FILLET							90–100	10" (256mm)
1/8" (3.2mm)	BUTT	1/16" (1.6mm)	3/32" (2.4mm)	4, 5, 6	ARGON	13 (6)	20	120–140	12" (307.2mm)
	FILLET							130–150	10" (256mm)
3/16" (4.8mm)	BUTT	3/32" (2.4mm)	1/8" (3.2mm)	5, 6, 7	ARGON	20 (10)	20	200–250	12" (307.2mm)
	FILLET	3/32" (2.4mm) 1/8" (3.2mm)						225–275	10" (256mm)
1/4" (6.4mm)	BUTT	1/8" (3.2mm)	3/16" (4.8mm)	8, 10	ARGON	35 (15)	20	275–350	10" (256mm)
	FILLET							300–375	8" (204.8mm)

LOW ALLOY STEEL (DCSP)

METAL GAUGE	JOINT TYPE	TUNGSTEN SIZE	FILLER ROD SIZE	CUP SIZE	SHIELD GAS FLOW			WELDING AMPERES	TRAVEL SPEED
					TYPE	CFH (L/MN)	PSI		
1/16" (1.6mm)	BUTT	1/16" (1.6mm)	1/16" (1.6mm)	4, 5, 6	ARGON	15 (7)	20	95–135	15" (384mm)
	FILLET							95–135	15" (384mm)
1/8" (3.2mm)	BUTT	1/16" (1.6mm) 3/32" (2.4mm)	3/32" (2.4mm)	4, 5, 6	ARGON	16 (6.5)	20	145–205	11" (258.6mm)
	FILLET							145–205	11" (258.6mm)
3/16" (4.8mm)	BUTT	3/32" (2.4mm)	1/8" (3.2mm)	7, 8	ARGON	25 (12)	20	210–260	10" (256mm)
	FILLET							210–260	10" (256mm)
1/4" (6.4mm)	BUTT	1/8" (3.2mm)	5/32" (4.0mm)	8, 10	ARGON	35 (17)	20	240–300	10" (256mm)
	FILLET (2)							240–300	10" (256mm)

WELDING DEOXIDIZED COPPER

Where extensive welding is to be done, the use of deoxidized (oxygen-free) copper is preferable over electrolytic tough pitch copper. Although TIG welding has been used occasionally to weld zinc-bearing copper alloys, such as brass and commercial bronzes, it is not recommended because the shielding gas does not suppress the vaporization of zinc. For the same reason zinc bearing filler rods should not be used. There is some preference of helium for the inert atmosphere in welding thickness above 1/8" (3.2mm) because of the improved weld metal fluidity. Preheating recommendations should be followed.

WELDING STAINLESS STEEL

In TIG welding of stainless steel, welding rods having the AWS-ASTM prefixes of E or ER can be used as filler rods. However, only bare uncoated rods should be used. Light gauge metals less than 1/16" (1.6mm) thick should always be welded with DCSP using argon gas. Follow the normal precautions for welding stainless such as: Clean surfaces; dry electrodes; use only stainless steel tools and brushes, keep stainless from coming in contact with other metals.

WELDING LOW ALLOY STEEL

Mild and low carbon steels with less than 0.30% carbon and less than 1" (2.5cm) thick, generally do not require preheat. An exception to this allowance is welding on highly restrained joints. These joints should be preheated 50 to 100°F (10 to 38°C) to minimize shrinkage cracks in the base metal. Low alloy steels such as the chromium-molybdenum steels will have hard heat affected zones after welding, if the preheat temperature is too low. This is caused by rapid cooling of the base material and the formation of martensitic grain structures. A 200 to 400°F (93 to 204°C) preheat temperature will slow the cooling rate and prevent the martensitic structure.

CK9

- Gas-Cooled
- 125 amp ACHF or DCSP @ 100%
- 7-1/2" (19.0cm) 2-3/4 oz (78gm)
- 2 Series Head Accessories (13N)

Torch Packages

CK9 & CK9V RIGID

HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Rigid Head	1 Piece	12½ ft. (3.8m)	CK9-12-R RG	CK9-12-RSF RG
		25 ft. (7.6m)	CK9-25-R RG	CK9-25-RSF RG
	2 Piece	12½ ft. (3.8m)	CK9-12-2 RG	CK9-12-2SF RG
		25 ft. (7.6m)	CK9-25-2 RG	CK9-25-2SF RG
Rigid Head w/ Valve	1 Piece	12½ ft. (3.8m)	CK9V-12-R RG	CK9V-12-RSF RG
		25 ft. (7.6m)	CK9V-25-R RG	CK9V-25-RSF RG
	2 Piece	12½ ft. (3.8m)	CK9V-12-2 RG	CK9V-12-2SF RG
		25 ft. (7.6m)	CK9V-25-2 RG	CK9V-25-2SF RG

CK9 & CK9V FLEX

HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Flex Head	1 Piece	12½ ft. (3.8m)	CK9-12-R FX	CK9-12-RSF FX
		25 ft. (7.6m)	CK9-25-R FX	CK9-25-RSF FX
	2 Piece	12½ ft. (3.8m)	CK9-12-2 FX	CK9-12-2SF FX
		25 ft. (7.6m)	CK9-25-2 FX	CK9-25-2SF FX
Flex Head w/ Valve	1 Piece	12½ ft. (3.8m)	CK9V-12-R FX	CK9V-12-RSF FX
		25 ft. (7.6m)	CK9V-25-R FX	CK9V-25-RSF FX
	2 Piece	12½ ft. (3.8m)	CK9V-12-2 FX	CK9V-12-2SF FX
		25 ft. (7.6m)	CK9V-25-2 FX	CK9V-25-2SF FX

CK9P & CK9PV PENCIL

HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Rigid Head	1 Piece	12½ ft. (3.8m)	CK9P-12-R	CK9P-12-RSF
		25 ft. (7.6m)	CK9P-25-R	CK9P-25-RSF
	2 Piece	12½ ft. (3.8m)	CK9P-12-2	CK9P-12-2SF
		25 ft. (7.6m)	CK9P-25-2	CK9P-25-2SF
Rigid Head w/ Valve	1 Piece	12½ ft. (3.8m)	CK9PV-12-R	CK9PV-12-RSF
		25 ft. (7.6m)	CK9PV-25-R	CK9PV-25-RSF
	2 Piece	12½ ft. (3.8m)	CK9PV-12-2	CK9PV-12-2SF
		25 ft. (7.6m)	CK9PV-25-2	CK9PV-25-2SF



CK9 RG

REPLACEMENT TORCH BODIES

PART #	STYLE
CK9 RG	RIGID
CK9 FX	FLEX
CK9V RG	VALVED RIGID
CK9V FX	VALVED FLEX
CK9P	PENCIL
CK9PV	VALVED PENCIL



CK9 FX

CK9V FX

CK9V RG

CK9P

1 PIECE STANDARD POWER CABLE



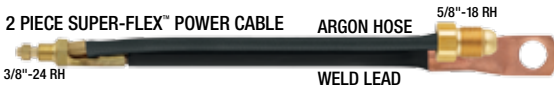
1 PIECE SUPER-FLEX™ POWER CABLE



2 PIECE STANDARD POWER CABLE



2 PIECE SUPER-FLEX™ POWER CABLE



LENGTH	STANDARD	SUPER-FLEX™
	1 PIECE CABLE	1 PIECE CABLE
12-1/2 ft. (3.8m)	57Y01R	57Y01RSF
25 ft. (7.6m)	57Y03R	57Y03RSF

LENGTH	STANDARD	SUPER-FLEX™
	2 PIECE CABLES	2 PIECE CABLES
12-1/2 ft. (3.8m)	57Y01-2	57Y01-2SF
25 ft. (7.6m)	57Y03-2	57Y03-2SF

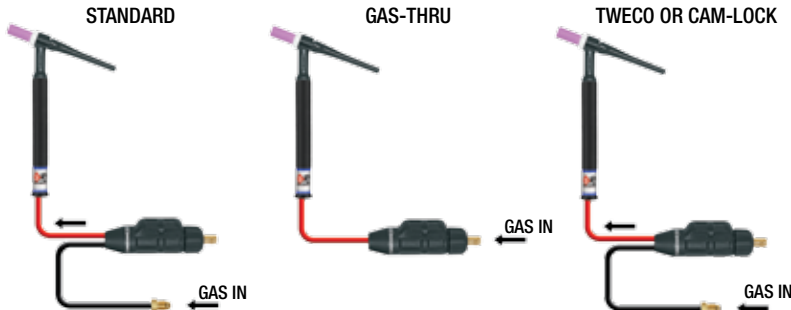
LENGTH	WELD LEAD
12-1/2 ft. (3.8m)	1512CN
25 ft. (7.6m)	1525CN

LENGTH	ARGON HOSE	ARGON HOSE
12-1/2 ft. (3.8m)	45V09	45V09SF
25 ft. (7.6m)	45V10	45V10SF

Power Cable Adapter



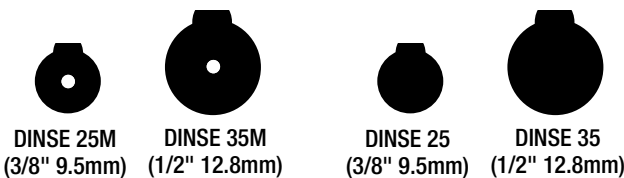
Dinse Connectors



STANDARD	
DINSE SIZE	ORDER #
3/8" (9.5mm)	SL2-25
1/2" (12.8mm)	SL2-35

GAS-THRU	
DINSE SIZE	ORDER #
3/8" (9.5mm)	SL2-25M
1/2" (12.8mm)	SL2-35M

TWECO OR CAM-LOCK	
DINSE STYLE	ORDER #
TWECO	SL-2
CAM-LOCK	SL2-CL



Handle

Part # HS



CK20

Torch Packages

- Water-Cooled
- 250 amp ACHF or DCSP @ 100%
- 7-1/2" (19.0cm) 3 oz (85gm)
- 2 Series Head Accessories (13N)

CK20 & CK20V RIGID				
HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Rigid Head	3 Piece	12½ ft. (3.8m)	CK20-12	CK20-12SF
		25 ft. (7.6m)	CK20-25	CK20-25SF
Rigid Head w/ Valve	3 Piece	12½ ft. (3.8m)	CK20V-12	CK20V-12SF
		25 ft. (7.6m)	CK20V-25	CK20V-25SF

CK20 & CK20V FLEX				
HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Flex Head	3 Piece	12½ ft. (3.8m)	CK20-12 FX	CK20-12SF FX
		25 ft. (7.6m)	CK20-25 FX	CK20-25SF FX
Flex Head w/ Valve	3 Piece	12½ ft. (3.8m)	CK20V-12 FX	CK20V-12SF FX
		25 ft. (7.6m)	CK20V-25 FX	CK20V-25SF FX

CK20P PENCIL				
HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Rigid Head	3 Piece	12½ ft. (3.8m)	CK20P-12	CK20P-12SF
		25 ft. (7.6m)	CK20P-25	CK20P-25SF

REPLACEMENT TORCH BODIES	
PART #	STYLE
CK20 RG	RIGID
CK20 FX	FLEX
CK20V RG	VALVED RIGID
CK20V FX	VALVED FLEX
CK20P	PENCIL



CK20 RG

CK25

Torch Packages

- Water-Cooled
- 250 amp ACHF or DCSP @ 100%
- 11" (27.9cm) 3 oz (85gm)
- 2 Series Head Accessories (13N)

CK25 PENCIL FLEX				
HEAD STYLE	CABLE	CABLE LENGTH	STANDARD #	SUPER-FLEX™ #
Flex Head	3 Piece	12½ ft. (3.8m)	CK25-12	CK25-12SF
		25 ft. (7.6m)	CK25-25	CK25-25SF



CK25



*Custom lengths available up to 10" (25.4cm), and uses the same thread pattern as the CK20

CK20/CK25

Power Cables/Hoses

STANDARD POWER CABLE



STANDARD ARGON HOSE



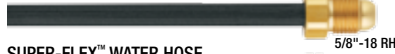
STANDARD WATER HOSE



SUPER-FLEX™ POWER CABLE



SUPER-FLEX™ ARGON HOSE



SUPER-FLEX™ WATER HOSE



LENGTH	STANDARD	SUPER-FLEX™
	POWER CABLE	POWER CABLE
12-1/2 ft. (3.8m)	45V03	45V03SF
25 ft. (7.6m)	45V04	45V04SF

LENGTH	WATER HOSE	WATER HOSE
	WATER HOSE	WATER HOSE
12-1/2 ft. (3.8m)	45V07	45V07SF
25 ft. (7.6m)	45V08	45V08SF

LENGTH	ARGON HOSE	ARGON HOSE
	ARGON HOSE	ARGON HOSE
12-1/2 ft. (3.8m)	45V09	45V09SF
25 ft. (7.6m)	45V10	45V10SF

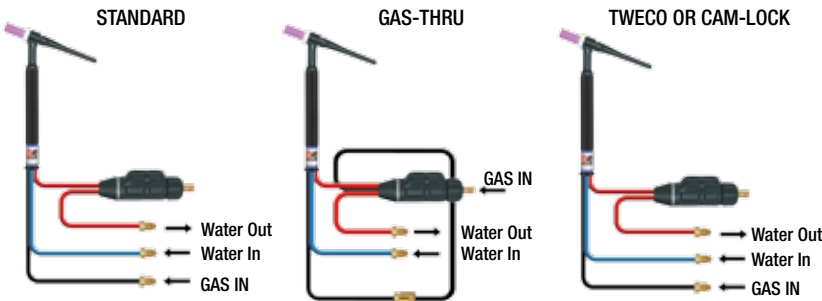
Power Cable Adapter

2PCA

(45V11)



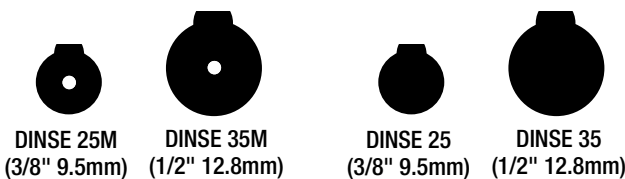
Dinse Connectors



STANDARD	
DINSE SIZE	ORDER #
3/8" (9.5mm)	SLWHAT-25
1/2" (12.8mm)	SLWHAT-35

GAS-THRU	
DINSE SIZE	ORDER #
3/8" (9.5mm)	SLWHAT-25M
1/2" (12.8mm)	SLWHAT-35M

TWECO OR CAM-LOCK	
DINSE STYLE	ORDER #
TWECO	SLWHAT-T
CAM-LOCK	SLWHAT-CL



Handle

Part # HS



2 SERIES PARTS TORCH MODELS 9 & 20

THREAD PATTERN: 5/16" x 24

CUP	COLLET BODY	COLLET	HEATSHIELD	TORCH	BACKCAP			
ALUMINA 2A4 (13N08) 2A5 (13N09) 2A6 (13N10)	STANDARD 2CB20 (13N25) 2CB40 (13N26) 2CB116 (13N27) 2CB332 (13N28) 2CB418 (13N29)	STANDARD 2C20 (13N20) 2C40 (13N21) 2C116 (13N22) 2C332 (13N23) 2C418 (13N24)	STANDARD 2GHS		LONG 200L (41V24)			
CERAMIC 2C4 (13N14) 2C5 (13N15) 2C6 (13N16)	2C7 (13N17) 2C8 (13N18) 2C10 (13N19)	WEDGE 2C040GS 2C332GS 2C116GS 2C418GS				TORCHES USED ON: CK100 CK110 CK130 CK200 CK230 FL2L CKM230 CWH230 CWM230 CK9 CK20 CK25	MEDIUM 200M (41V35)	
ALUMINA - LONG 2A3L (A796F70) 2A4L (A796F71)	2A5L (A796F72) 2A6L (A796F73)	REVERSE 6C20 6C332 6C40 6C418 6C116						SHORT 200S (41V33)
CERAMIC - LONG 2C3L (796F70) 2C4L (796F71)	2C5L (796F72) 2C6L (796F73)							
ALUMINA - GAS LENS 2AG4 (53N58) 2AG5 (53N59) 2AG6 (53N60)	2AG7 (53N61) 2AG8 (53N61S) 2AG10	STANDARD SEE ABOVE WEDGE SEE ABOVE REVERSE SEE ABOVE	STANDARD SEE ABOVE					
ALUMINA LONG - GAS LENS 2AG5L (53N59L) 2AG6L (53N60L)	2AG7L (53N61L)							
ALUMINA - LARGE DIAMETER 3AG6LD (57N75) 3AG8LD (57N74) 3AG10LD (53N88) 3AG11LD (53N89) 3AG12LD (53N87)	LARGE DIAMETER 2GL0204LD (45V0204S) 2GL116LD (45V116S) 2GL332LD (45V64S) 2GL418LD (995795S)	LARGE DIAMETER 2C020LD (13N20L) 2C040LD (13N21L) 2C116LD (13N22L) 2C332LD (13N23L) 2C418LD (13N24L)	LARGE DIAMETER 2GHSLD					
ALUMINA 8A4 (A53N24) 8A5 (A53N25) 8A6 (A53N27)	SHORT 6CB20 6CB40 6CB116 6CB332 6CB418	REVERSE SEE ABOVE	STANDARD SEE ABOVE					
CERAMIC 8C4 (53N24) 8C5 (53N25) 8C6 (53N27)								
CERAMIC - LONG 8C4L (53N28) 8C6L (53N26)								

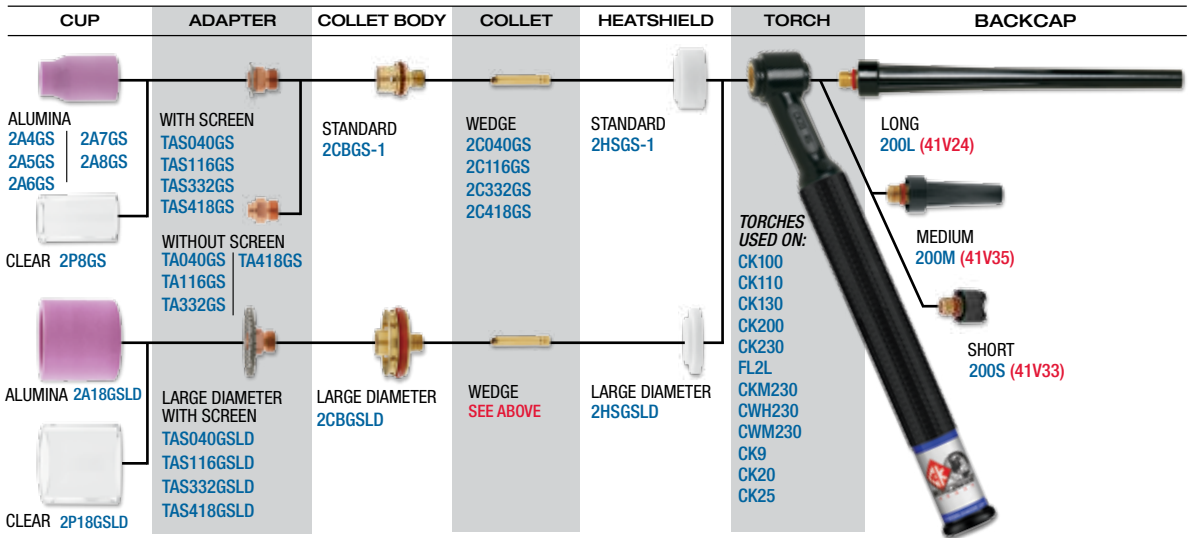
TUNGSTEN ELECTRODE CONVERSION CHART

	20	.020"	.5mm
	40	.040"	1.0mm
	116	1/16"	1.6mm
	332	3/32"	2.4mm
	418	1/8"	3.2mm
	532	5/32"	4.0mm
	316	3/16"	4.8mm
	14	1/4"	6.4mm

2C332 Size Suffix

2 SERIES GAS SAVER PARTS TORCH MODELS 9 & 20

THREAD PATTERN: 5/16" x 24



ACCESSORY KITS

Pre-packaged kits containing common consumables for our 2 Series torches.

ORDER # **AK-4** 2 SERIES



ITEM (Quantity 1 Each)	PART #
Long Backcap	200L (41V24)
1/16" (1.6mm) Collet	2C116 (13N22)
3/32" (2.4mm) Collet	2C332 (13N23)
1/8" (3.2mm) Collet	2C418 (13N24)
1/16" (1.6mm) Collet Body	2CB116 (13N27)
3/32" (2.4mm) Collet Body	2CB332 (13N28)
1/8" (3.2mm) Collet Body	2CB418 (13N29)
#5 (5/16" 8.0mm) Alumina Cup	2A5 (13N09)
#6 (3/8" 9.6mm) Alumina Cup	2A6 (13N10)
#8 (1/2" 12.8mm) Alumina Cup	2A8 (13N12)
1/16" (1.6mm) x 7" 2% Ceriated Tungsten	T1167GC2
3/32" (2.4mm) x 7" 2% Ceriated Tungsten	T3327GC2
1/8" (3.2mm) x 7" 2% Ceriated Tungsten	T187GC2

ORDER # **AK-4GS** 2 SERIES GAS SAVER



ITEM (Quantity 1 Each)	PART #
Long Backcap	200L (41V24)
1/16" (1.6mm) Collet	2C116GS
3/32" (2.4mm) Collet	2C332GS
1/8" (3.2mm) Collet	2C418GS
1/16" (1.6mm) Tungsten Adapter	TAS116GS
3/32" (2.4mm) Tungsten Adapter	TAS332GS
1/8" (3.2mm) Tungsten Adapter	TAS418GS
Collet Body	2CBGS-1
Heatshield	2HSGS-1
#4 (1/4" 6.4mm) Alumina Cup	2A4GS
#6 (3/8" 9.6mm) Alumina Cup	2A6GS
#8 (1/2" 12.8mm) Pryex Cup	2P8GS
1/16" (1.6mm) x 7" 2% Ceriated Tungsten	T1167GC2
3/32" (2.4mm) x 7" 2% Ceriated Tungsten	T3327GC2
1/8" (3.2mm) x 7" 2% Ceriated Tungsten	T187GC2

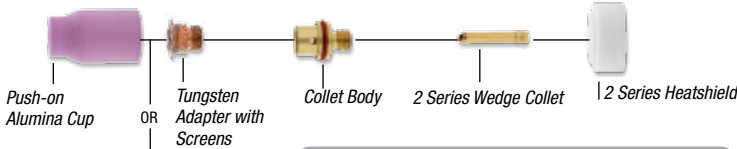
ORDER # **AK-1** 2 SERIES (NOT SHOWN)

.040" (1.0mm) 1/16" (1.6mm) accessory kit. See website for details.

STANDARD GAS SAVER™ KITS

- Provides better gas coverage versus standard collet bodies
- Tungsten stick-out can be up to 6 times the electrode diameter
- Clear Pyrex or Alumina push on nozzles available
- Improves visibility
- Less expensive replacement parts than standard gas lenses
- Fits most standard silicone rubber insulated torch bodies
- Replaceable Screen Adapter

KIT CONSISTS OF ITEMS BELOW (ONE EACH)



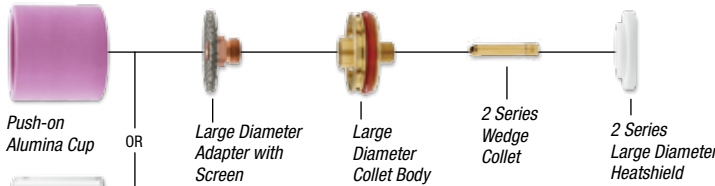
2 SERIES COMPLETE FRONT END KITS			CK EXCLUSIVE
USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER	
CK9, CK20	1/16" (1.6mm)	D2GS116	ALUMINA
	3/32" (2.4mm)	D2GS332	
	1/8" (3.2mm)	D2GS418	
CK9, CK20	1/16" (1.6mm)	D2GS116L-P	PYREX
	3/32" (2.4mm)	D2GS332-P	
	1/8" (3.2mm)	D2GS418-P	



LARGE DIAMETER GAS SAVER™ KITS

With a cup orifice of 1-1/8" (28.5 mm) the Large Diameter Gas Saver™ kit provides a large inert atmosphere for the welding of reactive metals such as titanium, molybdenum, nickel-based and aluminum-based alloys as well as non-reactive metals like stainless steel.

KIT CONSISTS OF ITEMS BELOW (ONE EACH)



2 SERIES LARGE DIAMETER KITS			CK EXCLUSIVE
USE ON TORCHES	TUNGSTEN SIZE	ORDER NUMBER	
CK9, CK20	1/16" (1.6mm)	D2GS116LD-A	ALUMINA
	3/32" (2.4mm)	D2GS332LD-A	
	1/8" (3.2mm)	D2GS418LD-A	
CK9, CK20	1/16" (1.6mm)	D2GS116LD	PYREX
	3/32" (2.4mm)	D2GS332LD	
	1/8" (3.2mm)	D2GS418LD	



GREAT FOR TITANIUM!

REMOTE AMPERAGE CONTROLS

- Available in either Steady-Grip™ rotary, linear slide, or spring loaded wheel configurations
- Fits most makes and models of TIG power supplies
- Controls contactor on / off, gas solenoids and full range current output
- Available with a Velcro strap or built into the torch handle
- Contact CK for order numbers

Flex-Loc™ torch not included.



STEADY-GRIP™
Velcro Straps

ROTARY
Velcro Straps



LINEAR SLIDE
Built-In – Handle
(For CK torches)



SPRING LOADED WHEEL
Velcro Straps



**ABRASION,
HEAT, OIL, FLAME
AND UV RESISTANT**

LEATHER VELCRO HOSE COVERS

LEATHER HOSE COVERS *CK EXCLUSIVE*

USED ON TORCHES	LENGTH	WIDTH	INSIDE DIAMETER	ORDER NUMBER
CK9, CK20	10 ft. (3.0m)	3-3/4" (94mm)	1" (24.5mm)	212HCLV
	22 ft. (7.0m)	3-3/4" (94mm)	1" (24.5mm)	225HCLV
CK17, CK18, CK26	10 ft. (3.0m)	4-1/2" (113mm)	1-1/4" (30.6mm)	312HCLV
	22 ft. (7.0m)	4-1/2" (113mm)	1-1/4" (30.6mm)	325HCLV

TUNGSTEN ELECTRODE GRINDER

TURBO-SHARP® X

- Enclosed electrode grinder
- Minimizes grinding dust exposure to both the user and the environment
- Standard head for diameters:
 - .040" (1.0mm)
 - 1/16" (1.6mm)
 - 3/32" (2.4mm)
 - 1/8" (3.2mm)
- Angles adjustable from 20°–60°
- Consistent tip geometry
- Eliminate grinding wheel contamination

SPECIFICATIONS

Voltage **120V AC**
 Single Phase..... **60 Hz**
 Power **710 W**
 Amp..... **6.45 A**
 No Load Speed **34,000 RPM**
 Weight **4.1 lbs. (1,860 grams)**
 Ship Weight **10.1 lbs. (4,581 grams)**
 Warranty..... **2 years**

230V available, contact us for more information



New improved TURBO-SHARP® features adjustable head! – GRINDING DISCS LAST 3 x LONGER!!

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Excessive Electrode Consumption	Inadequate gas flow	Increase gas flow
	Improper size electrode for current required	Use larger electrode
	Operating of reverse polarity	Use larger electrode or change polarity
	Electrode contamination	Remove contaminated portion, then prepare again
	Excessive heating inside torch	Replace collect, try wedge collet or reverse collet
	Electrode oxidizing during cooling	Increase gas post flow time to 1 sec. per 10 amps
	Shield gas incorrect	Change to proper gas (no oxygen or Co2)
Erratic Arc	Incorrect voltage (arc too long)	Maintain short arc length
	Current too low for electrode size	Use smaller electrode or increase current
	Electrode contaminated	Remove contaminated portion, then prepare again
	Joint too narrow	Open joint groove
	Contaminated shield gas, dark stains on the electrode or weld bead indicate contamination	Most common cause is moisture or aspirated air in gas stream. Use welding grade gas only. Find the source of the contamination and eliminate it promptly.
	Base metal is oxidized, dirty or oily	Use appropriate chemical cleaners, wire brush or abrasives prior to welding.
Inclusion of Tungsten or Oxides in Weld	Poor scratch starting technique	Many codes do not allow scratch starts. Use copper strike plate. Use high-frequency arc starter.
	Excessive current for tungsten size used	Reduce current or use larger electrode
	Accidental contact of electrode with puddle	Maintain proper arc length
	Accidental contact of electrode to filler rod	Maintain a distance between electrode and filler metal
	Using excessive electrode extension	Reduce electrode extension to recommended limits
	Inadequate shielding or excessive drafts	Increase gas flow, shield arc from wind, or use gas lens
	Wrong gas	Do not use Ar-O2 or Ar-Co2 GMA (MIG) gases for TIG welding
Heavy surface oxides not being removed	Use ACHF, adjust balance control for maximum cleaning, or wire brush and clean the weld joint prior to welding.	
Porosity in Weld Deposit	Entrapped impurities, hydrogen, air, nitrogen, water vapor	Do not weld on wet material. Remove condensation from line
	Defective gas hose or loose connection	Check hoses and connections for leaks
	Filler material is damp (particularly aluminum)	Dry filler metal in oven prior to welding
	Filler material is oily or dusty	Replace filler metal
	Alloy impurities in the base metal such as sulphur, phosphorus, lead and zinc	Change to a different alloy composition which is weldable. These impurities can cause a tendency to crack when hot.
	Excessive travel speed with rapid freezing of weld trapping gases before they escape	Lower the travel speed
	Contaminated gas shield	Replace the shielding gas
Cracking in Welds	Hot cracking in heavy section or with metals which are hot shorts	Preheat, increase weld bead cross-section size, change weld bead contour.
	Crater cracks due to improperly breaking the arc or terminating the weld at the joint edge	Reverse direction and weld back into previous weld at edge. Use remote or foot control to manually down slope current.
	Post weld cold cracking, due to excessive joint restraint, rapid cooling, or hydrogen embrittlement	Preheat prior to welding, use pure to non-contaminated gas. Increase the bead size. Prevent craters or notches. Change the weld joint design.
	Centerline cracks in single pass welds	Increase bead size. Decrease root opening, use preheat, prevent craters.
	Underbead cracking from brittle microstructure	Eliminate sources of hydrogen, joint restraint, and use preheat.
Inadequate Shielding	Gas flow blockage or leak in hoses or torch	Locate and eliminate blockage or leak.
	Excessive travel speed exposes molten weld to atmospheric contamination	Use slower travel speed or carefully increase the flow rate to a safe level below creating excessive turbulence. Use trailing shield cup.
	Wind or drafts	Set up screens around the weld area
	Excessive electrode stickout	Reduce electrode stickout. Use a larger size cup.
	Excessive turbulence in gas stream	Change to gas saver parts or gas lens parts.
Arc Blow	Induced magnetic field from DC weld current	Change to ACHF current. Rearrange the split ground connection.
	Arc is unstable due to magnetic influences	Reduce weld current and use arc length as short as possible.
Short Parts Life	Short water cooled leads life	Verify coolant flow direction, return flow must be on the power cable lead.
	Cup shattering or breaking in use	Change cup size or type, change tungsten position, refer to CK Worldwide technical specifications available at www.CKWORLDWIDE.com
	Short collet life	Ordinary style is split and twists or jams, change to wedge style.
	Short torch head life	Do not operate beyond rated capacity, use water cooled model, do not bend rigid torches.
	Gas hoses ballooning, bursting or blowing off while hot	Incorrect flowmeter, TIG flowmeters operate at 35 psi with low flows. MIG flowmeters operate with high flows at 65 psi or more.

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www.CKWORLDWIDE.com

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