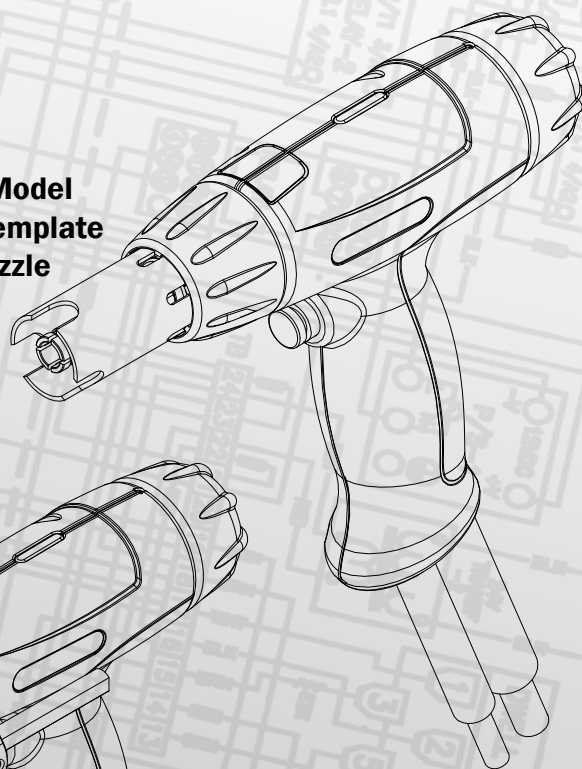


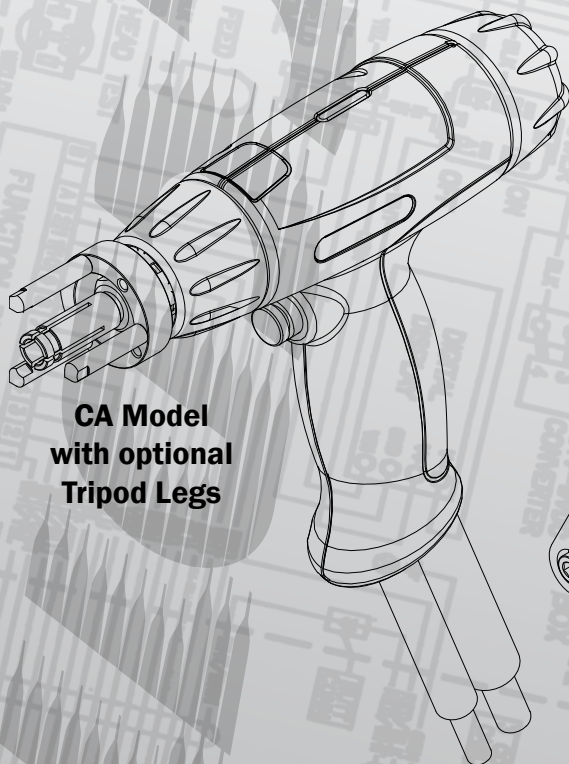
WELD TOOLS

CCD110 WELD TOOLS PART

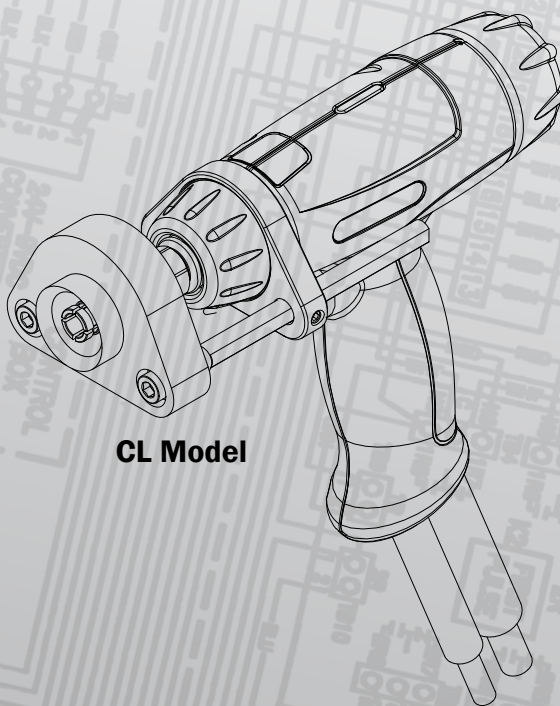
CA Model
with Template
Nozzle



CA Model
with optional
Tripod Legs



CL Model



DURO[®]
DYNE
MACHINERY
DIVISION

OWNER'S MANUAL

UNIT INSTRUCTIONS

Please follow all CCD110 Safety Instructions.

Contact your Duro Dyne Tech Service if you have any operating questions. Please report any problems or malfunctions to Duro Dyne Tech Service.

IMPORTANT

High Voltage may be present inside CCD110 case even when disconnected from power source! Do not open or disassemble this unit to trouble shoot or repair. Contact Duro Dyne Tech Service if servicing or trouble shooting of machine is needed.

Duro Dyne Tech Service Contact Information:

Toll Free: 1-800-899-3876

Mon - Fri. 7:00 am - 7:00 PM EST

LIMITED WARRANTY

Duro Dyne warrants this CCD110 welding equipment to be in good working order for a period of 1 year from the date of purchase; from Duro Dyne or an authorized Duro Dyne equipment dealer. Should this product fail to be in good working order at any time during the 1 year warranty period, Duro Dyne will at its option, repair or replace the defective component at no additional charge except as set forth below.

Repair parts and replacement products will be furnished on an exchange basis and will be either new, remanufactured or refurbished, at the discretion of Duro Dyne. All replaced parts and products become the property of Duro Dyne.

This limited warranty does not include repair of damage to the product resulting from accident, disaster, misuse, abuse, non Duro Dyne modification of the product, or other events outside Duro Dyne's reasonable control or not arising under normal operation conditions.

Limited Warranty service may be obtained by returning the Product during the 1 year warranty period to Duro Dyne by UPS or carrier, to Duro Dyne in accordance with the instructions provided to you by the Tech Service/ Customer Service and provide proof of purchase date.

If this product is returned to Duro Dyne, you agree to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges to the designated warranty service location and to ship the Product in the original shipping container or equivalent.

Contact your authorized Duro Dyne customer service representative for further information.

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BE SURE THIS INFORMATION REACHES THE OPERATOR. EXTRA COPIES ARE AVAILABLE THROUGH YOUR SUPPLIER.



CAUTION

THESE INSTRUCTIONS ARE FOR EXPERIENCED OPERATORS. If you are not fully familiar with the principles of operation and safe practices for arc welding equipment, we urge you to read AWS SP - "Safe Practices" available from the American Welding Society.

DO NOT permit untrained persons to install, operate, or maintain this equipment. DO NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

SAFETY PRECAUTIONS

USERS RESPONSIBILITY

This equipment will perform in conformity with the description contained in this manual and accompanying labels and/or inserts when installed, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Defective equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.



This symbol appearing throughout this manual means
ATTENTION! BE ALERT!
Your safety is involved.

The following definitions apply to **DANGER, WARNING, CAUTION** found throughout this manual.



DANGER

Used to call attention to immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.



WARNING

Used to call attention to potential hazards which could result in personal injury or loss of life.



CAUTION

Used to call attention to hazards which could result in minor personal injury.



WARNING: These Safety Precautions are for your protection. They summarize precautionary information from the references listed in the Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.

SAFETY PRECAUTIONS



ARC RAYS CAN BURN EYES AND SKIN -

The arc, like the sun, emits ultraviolet and infrared (visible and in-visible) and other radiation and can injure skin and eyes. Sparks and hot metal can fly off the weld. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

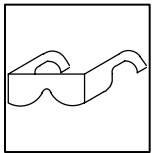
- 1) Always wear safety glasses with side shields in any work area, even if wearing a welding helmet, face shields and goggles are also required.
- 2) Always use a face shield fitted with the correct shade of filter to protect your face and eyes when welding or watching (See ANSI Z49.1 and Z87.1 listed in Safety Standards). Cover sparks and rays of the arc when operating or observing operations.
- 3) Use protective non-flammable screens or barriers to protect others from flash and glare. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
- 3) Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high topped shoes, and a welding helmet or cap for hair protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
- 4) Hot sparks or metal can lodge in rolled up sleeves, trousers cuffs or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing.
- 6) Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.



ELECTRIC AND MAGNETIC FIELDS -

Electric and Magnetic Fields may be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

- 1) Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
- 2) Exposure to EMF may have other health effects which are unknown.
- 3) Welders should use the following procedures to minimize exposure to EMF:
 - A) Route the electrode and work cables together. Secure them with tape when possible.
 - B) Never coil the torch or work cable around your body.
 - C) Do not place your body between the torch and work cables. Route cables on the same side of your body.
 - D) Connect the work cable to the work piece as close as possible to the area being welded.
 - E) Keep welding power source and cables as far away from your body as possible.



FLYING METAL CAN INJURE EYES -

- 1) Welding, chipping, wire brushing and grinding can cause sparks and flying metal. As welds cool, they can throw off slag.
- 2) Wear approved safety glasses with side shields even under your welding helmet.



BUILD UP OF GAS CAN INJURE OR KILL -

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



ELECTRICAL SHOCK -

Contact with live electrical parts and ground can cause severe injury or death. The electrode (the weld stud and chuck) and work circuit (ground) are electrically live whenever the output is on. The input power circuit and the machine internal circuits are also live whenever power is on. Improperly installed or improperly grounded equipment is a hazard.

- 1) Disconnect input power before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- 2) Do not touch live electrical parts. Do not touch the electrode (stud) if you are in contact with the work, ground, or another electrode from a different machine.
- 3) Be sure the power source frame (chassis) is connected to the ground system of the input power.
- 4) When making input connections, attach proper grounding conductors first and then double-check connections.
- 5) Always verify the supply ground - check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- 6) Refer to ANSI/ASC Standard Z49.1 (listed on page 6) for specific grounding recommendations. Do not mistake the work lead for a ground cable.
- 7) Clamp work cable with good metal-to-metal contact (spring and/or magnetic clamps are not recommended) to work piece as near the weld as practical.
- 8) DO NOT use welding current in damp areas, if movement is confined, or if there is danger of falling.
- 9) Properly install and ground this equipment according to this Owner's Manual and national, state and local codes.
- 10) Connect the work cable to the work piece. A poor or missing connection can expose you or others to a fatal shock.
- 11) Keep everything dry, including clothing, work area, cables, torch/electrode holder and power source.
- 12) Wear dry, hole-free insulated gloves & body protection before turning on power.
- 13) Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- 14) Don't stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
- 15) Turn off all equipment when not in use.
- 16) Use well-maintained equipment. Frequently inspect input power cord and output weld cables for damage or bare wiring. Replace worn or damaged cables immediately; bare wiring can kill. Repair or replace damaged parts at once. Maintain this unit according to the manual.
- 17) Do not use worn, damage, undersized or poorly spliced cables.
- 18) Do not drape cables over your body.
- 19) If earth grounding of the work piece is required, use a separate cable.
- 20) Wear a safety harness if working above floor level.
- 21) Keep all panels and covers securely in place.
- 22) Insulate work clamp when not connected to work piece to prevent contact with any metal object.
- 23) Don't connect multiple electrodes or work cables to a single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of the input power on inverters. Turn off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

SAFETY PRECAUTIONS



FUMES AND GASES -

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause asphyxiation. Therefore:

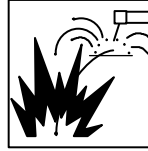
- 1) Keep your head out of the fumes. Do not breathe the fumes.
- 2) If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- 3) If ventilation is poor, use an approved air-supplied respirator.
- 4) Read the Material Safety Data Sheets (MSDS) and the manufacturer's instructions for metals, consumables, coatings, cleaners and degreasers.
- 5) Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- 6) Don't weld in locations near degreasing, cleaning or spraying operations. The heat & rays of an arc can react with vapors to form highly toxic & irritating gases.
- 7) Don't weld on coated metals, such as galvanized, lead or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.
- 8) Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
- 9) If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work areas. Do not continue to operate if physical discomfort persists.
- 10) Refer to ANSI/ASC Standard Z49.1 for specific ventilation recommendations.



CYLINDER HANDLING -

Shielding gas cylinders contain gas under high pressure. If damaged or mishandled a cylinder can explode and violently release gas. Sudden rupture of cylinder, valve, or relief device can injure or kill. Since gas cylinders are normally part of the welding process, be sure to treat them carefully. Therefore:

- 1) Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks and arcs.
- 2) Keep cylinders away from any welding or other electrical circuits
- 3) Never drape a welding tool over a gas cylinder
- 4) Never allow a welding electrode (weld stud) to touch any cylinder
- 1) Use the proper gas for the process and use the proper pressure reducing regulator, hoses and fittings designed to operate from the specific compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings and other associated parts in good condition.
- 2) Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
- 3) When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
- 4) Locate cylinders away from heat, sparks, and flames. Never strike an arc or weld on a cylinder; it will explode.
- 6) Turn face away from valve outlet when opening cylinder valve.
- 5) For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202

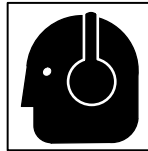


WELDING CAN CAUSE FIRES AND EXPLOSIONS -

Welding on closed containers, such as tanks, drums or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, 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. Therefore:

- 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 combustible materials a minimum of 35ft away from the welding arc or cover the materials with a protective nonflammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
- 4) Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.
- 5) Do not weld, cut, or perform other hot work until the work piece has been completely cleaned so that there are no substances on the work piece which might produce flammable or toxic vapors.
- 6) Be aware that welding on a ceiling, floor, bulkhead or partition can cause fire on the hidden side.
- 7) Do not weld on closed containers such as tanks, drums or pipes unless they are properly prepared according to AWS F4.1.
- 8) Connect work cable to the work 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.
- 9) Do not use welder to thaw frozen pipes.
- 10) Remove electrode (weld stud) from the stud weld tool when not in use.
- 11) Remove any combustibles, such as a butane lighter or matches from your person before doing any welding.
- 12) Have appropriate fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket or portable fire extinguisher. Be sure you are trained for proper use.
- 13) Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
- 14) After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
- 15) For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269



NOISE CAN DAMAGE HEARING -

Noise from some processes or equipment can damage hearing.

- 1) Wear approved ear protection if noise level is high



FIRE OR EXPLOSION HAZARD -

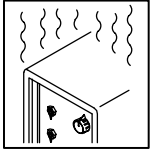
- 1) Do not install or place unit on, over, or near combustible surfaces.
- 2) Do not install unit near flammables.
- 3) Do not overload electrical wiring - be sure power supply system is properly sized, rated and protected to handle the unit.

SAFETY PRECAUTIONS



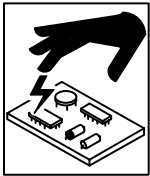
FALLING UNITS CAN CAUSE INJURY -

- 1) Use lifting eye to lift unit only, NOT running gear, gas cylinders or any other accessories.
- 2) Use equipment of adequate capacity to lift and support unit.
- 3) If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of the unit.



OVERUSE CAN CAUSE OVERHEATING -

- 1) Allow cooling period; follow rated duty cycle.
- 2) Reduce current or reduce duty cycle before starting to weld again.
- 3) Do not block or filter airflow to unit.



STATIC (ESD) CAN DAMAGE PC BOARDS -

- 1) Put on grounded wrist strap BEFORE handling boards or parts.
- 2) Use proper static-proof bags and boxes to store, move or ship PC boards.



WELDING WIRE CAN CAUSE INJURY -

- 1) Do not press weld tool trigger until instructed to do so.
- 2) Do not point weld tool toward any part of the body, other people or any metal when threading welding wire.



MOVING PARTS CAN CAUSE INJURY -

- 1) Keep hands, hair, loose clothing and tools away from moving parts.
- 2) Keep away from pinch points such as drive rolls.



EQUIPMENT MAINTENANCE -

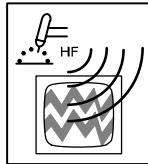
Faulty or improperly maintained equipment can cause injury or death. Therefore:

- 1) Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to do the work.
- 2) Before performing any work inside a power source, disconnect the power source from the incoming electrical power using the disconnect switch at the fuse box before working on the equipment.
- 3) Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
- 4) Do not abuse any equipment or accessories. Keep equipment away from:
 - heat sources such as furnaces
 - wet conditions such as water puddles and inclement weather
 - oil or grease
 - corrosive atmospheres.
- 5) Keep all safety devices and cabinet covers in position and in good repair.
- 6) Use equipment only for its intended purpose. Do not modify it in any manner.



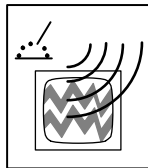
MOVING PARTS CAN CAUSE INJURY -

- 1) Keep hands, hair loose clothing and tools away from moving parts such as fans.
- 2) Keep all doors, panels, covers and guards closed and securely in place.
- 3) Always disconnect electrical power prior to service to prevent the fan from starting unexpectedly.



H.F. RADIATION CAN CAUSE INTERFERENCE -

- 1) High-Frequency (H.F.) can interfere with radio navigation, safety services, computers and communications equipment.
- 2) Have only qualified persons familiar with electronic equipment perform this installation.
- 3) The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- 4) If notified by the FCC about interference, stop using the equipment at once.
- 5) Have the installation regularly checked and maintained.
- 6) Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING CAN CAUSE INTERFERENCE -

- 1) Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- 2) Be sure all equipment in the welding area is electro-magnetically compatible.
- 3) To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- 4) Locate welding operation 100 meters from any sensitive electronic equipment.
- 5) Be sure this welding machine is installed and grounded according to this manual.
- 6) If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.



HOT PARTS CAN CAUSE SEVERE BURNS -

- 1) Do not touch hot parts with bare hands.
- 2) Allow cooling period before working on welding tool (gun or torch).

EMF Information

Considerations about welding and the effects of low frequency Electric and Magnetic Fields (EMF):

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgement, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting. See section on EMF on page 2.

SAFETY PRECAUTIONS

California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and , in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For 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.

ADDITIONAL SAFETY INFORMATION -

For more information on safe practices for electric arc welding refer to the following publications:

American Welding Society

550 N.W. LeJuene Road, Miami, FL 33126, (phone 305-443-9353, website: www.aws.org)

- 1) ANSI/ASC Z49.1 - Safety in Welding, Cutting and Allied Processes
- 2) AWS CH5 - Recommended Practices for Stud Welding
- 3) AWS D1.1 - Structural Welding
- 2) AWS C5.1 - Recommended Practices for Plasma Arc Welding
- 3) AWS C5.6 - Recommended Practices for Gas Metal Arc Welding
- 4) AWS SP - Safe Practices - Reprint, Welding Handbook.
- 5) ANSI/AWS F4.1, Recommended Safe Practices for Welding and Cutting of Containers and Piping.

National Fire Protection Association

P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (phone 617-770-3000, website: www.nfpa.org and sparky.org)

- 1) NFPA Standard 70 - National Electrical Code
- 2) NFPA Standard 51B - Standard for Fire Prevention During Welding, Cutting and Other Hot Work

Compressed Gas Association

1735 Jefferson Davis Highway, Suite 1004; Arlington, VA 22202-4102 (phone 703-412-0900, website: www.cganet.com)

- 1) CGA Pamphlet P-1 - Safe Handling of Compressed Gas Cylinders

Canadian Standards Association

Standards Sales, 178 Rexdale Blvd, Rexdale, Ontario, Canada M9W 1R3 (phone 800-463-6727 in Toronto 416-747-4044, website: www.csa-international.org)

- 1) CSA Standard W117.2 - Code for Safety in Welding and Cutting

American National Standards Institute

11 West 42nd Street, New York, NY 10036-8002 (phone 212-642-4900, website: www.ansi.org)

- 1) ANSI Standard Z87.1 - Practice for Occupational and Educational Eye and Face Protection

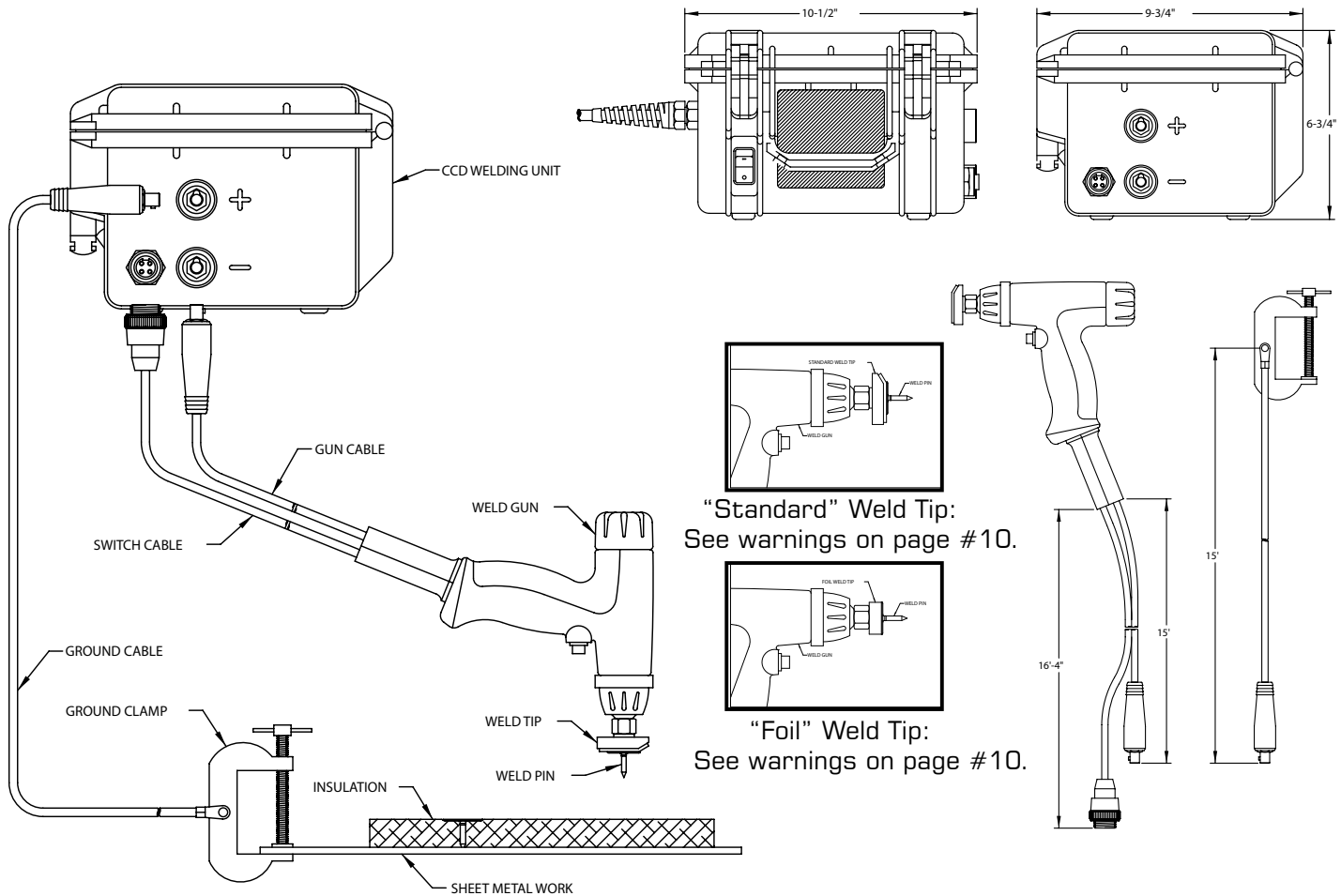
U.S. Government Printing Office

Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (phone 312-353-2220, website: www.osha.gov)

- 1) Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, & Part 1926, Subpart J - Occupational Safety and Health Standards for General Industry

With any power source, it may or may not contain a battery which may contain hazardous materials. Please follow local battery disposal procedures when changing batteries or disposing of the power supply.

PARTS LOCATION



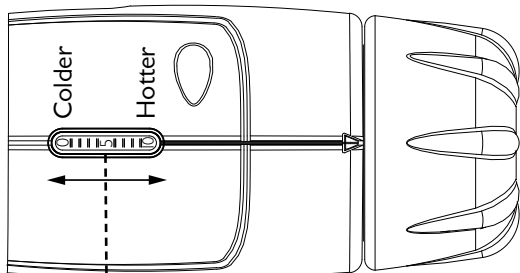
FACTORY SETTINGS

The **CCD110** is factory set at a weld parameter mid range (5) between colder/hotter.

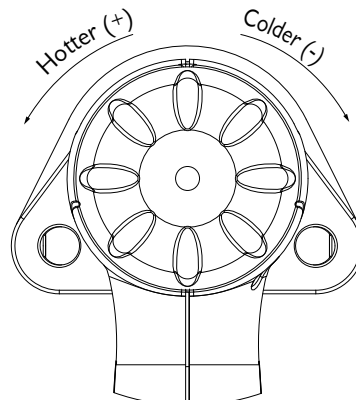
Machinery Voltage is set to 125 for 24 gauge steel and 3/4" steel pins. User should adjust the voltage and weld parameter accordingly up or down based on the thickness of steel and pin length being used.

The **CCD110** will weld pins from 1/2" to 4" long on steel from 26 to 20 gauge.

To adjust, turn the rear knob clockwise to increase spring force and counter clockwise to decrease spring force. A clear indicating window with an indicator light is provided to indicate spring compression for multiple setup applications.



**Weld parameter mid range (5)
between colder/hotter.**



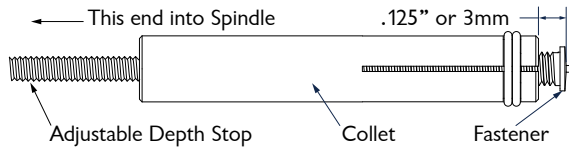
INSTALLATION & SET-UP

Before you begin to weld it is important to review the set up. By making sure that the weld tool is set up properly, you will have the best welding results. A majority (about 95%) of all stud welding problems are due to improper weld tool set up or improper power settings.

COLLET ADJUSTMENT

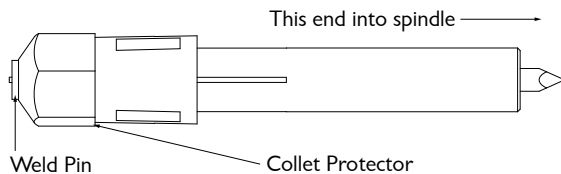
Collet Adjustment with Adjustable Depth Stop

It is necessary to properly set up the collet for the size fastener you are welding. First select the proper diameter collet for the size fastener you are welding (see chart below). Secondly, the adjustable depth stop must be set to accommodate the length of the fastener. The stop should be set so that 3mm or .125" of the stud sticks past the end of the collet and the stud is firmly against the adjustable depth stop. Note: Some collets may have a jam nut. Adjust depth stop to required height and firmly tighten jam nut while holding the depth stop position with a screwdriver (not shown).



Collet with Collet Protector (Gauge Series Collets)

Gauge series collets include a collet protector which prevents contact between the end of the collet and the weld pin. This feature prevents arcing between the pin and the collet. Also, gauge series collets contain no depth stop which allows long length pins to be used with the weld tool.



Select the appropriate sized collet and protector for the fastener to be welded. The fastener should be inserted so the head of the pin is pressed firmly against the collet protector. The collet protector should be periodically inspected to insure that no foreign material is embedded in the collet protector.

Fastener Size	DD Collet Part #
14 GA	CLI08P*
#4	CLI10
12 GA	CLI10P*
#6	CLI13
10 GA	CLI13P*
#8	CLI16
#10	CLI19
1/4	CLI25
5/16	CLI31
3/8	CLI37
M3	CLIM3
M4	CLIM4
M5	CLIM5
M6	CLIM6

* The Duro Dyne Collet Part Numbers in the table to the left having asterisks indicate the gauge series collets designed for long fasteners. Gauge series Collets have no provision for a depth stop and include a collet protector.

INSTALLATION & SET-UP

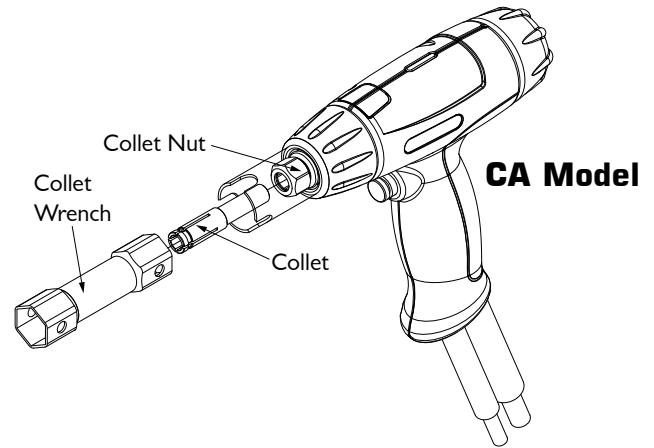
COLLET INSTALLATION AND REMOVAL

CA Model

To install a collet, make sure the collet nut is loose and that the collet slides freely into the spindle. Slide the collet into the spindle until it bottoms out at the back of the spindle. Do not force collet into spindle. Tighten collet finger tight with supplied collet nut wrench (part #GRM12). Do not use a bar or other leverage to over-tighten the collet nut. This will damage the spindle.

Note: It is not necessary to remove the collet nut from the spindle to install or remove a collet.

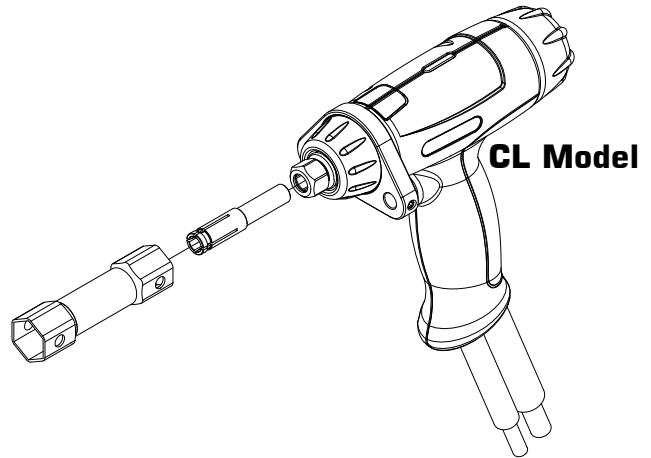
To remove a collet, loosen the collet nut with the supplied collet nut wrench (part #GRM12). Grasp the collet and pull collet away from the weld tool body.



CL Model

The CL model works similarly. However, to use the supplied collet wrench, the legs and foot must be removed. Alternately, a standard 5/8 or 16mm open end wrench can be used to loosen and tighten the collet nut.

Note: If using a tool other than the supplied wrench, DO NOT over tighten the collet nut. This can damage the main spindle.



WELD TIP APPLICATIONS

There are 2 types of Weld Tips included with this unit; a "Standard" Weld Tip and a "Foil" Weld Tip.

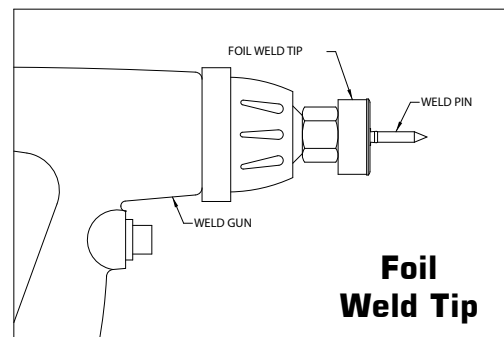
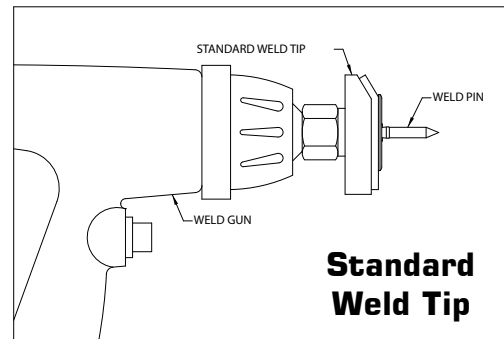
"Standard" Weld Tip:

For use with all types of weld pins & non-foil insulation.

*Caution: Do not use on foil faced insulation.

"Foil" Weld Tip:

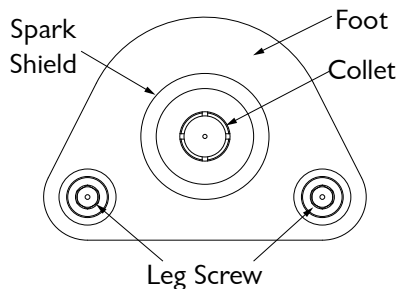
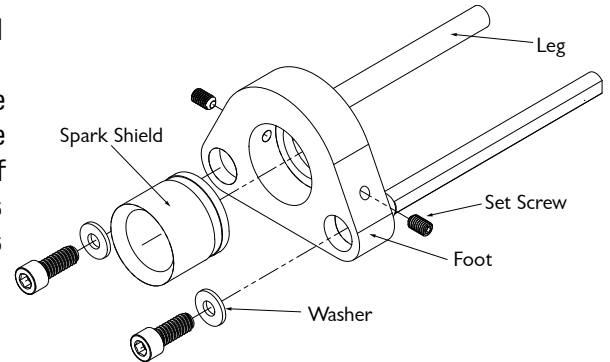
For use with all types of weld pins & insulation that has a layer of foil.



INSTALLATION & SET-UP

FOOT & LEG SET UP (CL Model Only)

The CL model weld tool comes supplied with a foot and spark shield. The foot is installed on the ends of the legs. Alignment of the foot is important. The collet should be located in the center of the spark shield. To install the foot, unscrew the socket head screws from the ends of the legs. Place the washers on the socket head screws and place the screws through the counter bored holes in the foot. Reattach the screws to the legs.

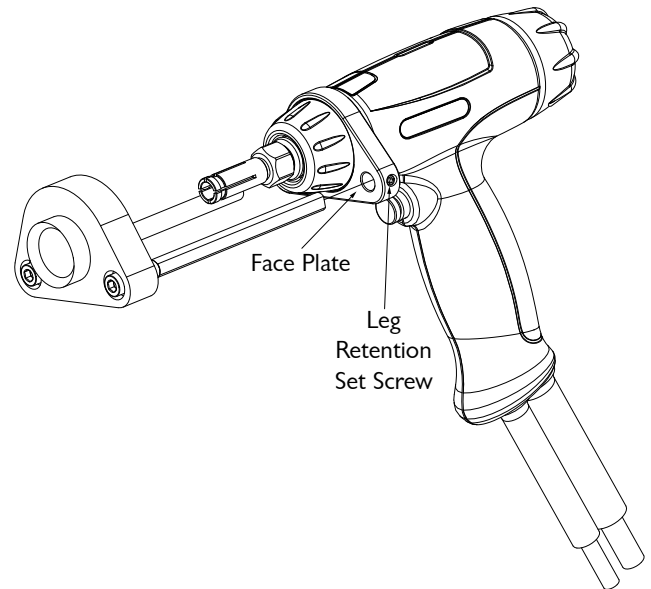


When installing the legs on the foot be sure and align the flats of the legs to the outside. This allows the set screws in the tool faceplate to properly retain the legs without damage.

To remove or install the spark shield, find the set screw(s) that retain(s) the spark shield in the foot. Loosen the set screw and push the spark shield into the foot. The spark shield is sometimes a tight fit so press it firmly into the set screws in the foot so it seats against the back stop. Do not over tighten the set screws.

Insert the legs into the face plate. Line up the flat on the leg with the face plate set screw. (Tighten the set screws in the side of the legs.) The set screw will bite into the flat region and hold the leg securely. If the set screw bites into the round portion of the leg it will cause damage to the leg so it won't insert into the weld tool face plate anymore.

Note: If the round part of the leg has a burr, remove the burr with a metal file so that it can slide easily in the face plate. If the leg is bent, replace the leg.



INSTALLATION & SET-UP

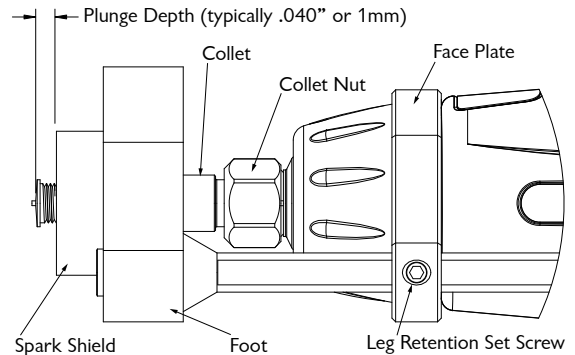
PLUNGE ADJUSTMENT

Plunge, or the amount of weld stud sticking past the end of the spark shield or template nozzle, should be set to 1mm (.040") which is approximately the thickness of the flange of a typical Capacitor Discharge Weld Stud.

Note: The collet depth stop should be set properly prior to adjusting the plunge. See section on adjusting collets.

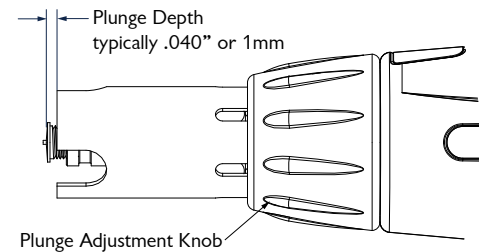
Adjusting Plunge for CL Model

To adjust plunge, loosen the leg retention set screw on both sides of the face plate. Slide the leg and foot assembly forward or backward until 1mm of the weld stud protrudes past the end of the spark shield. Retighten the leg retention set screws.



Adjusting Plunge for CA Model

To adjust plunge, pull out the plunge adjustment knob away from the tool body and rotate to the right, or follow the direction indicated on the decal, to decrease plunge. Rotate the plunge adjustment knob to the left, or follow the direction indicated on the decal, to increase plunge. Rotate knob until 1mm of the weld stud protrudes past the end of the spark shield or tripod legs. The knob will automatically lock into position once released. The same process is used for the tripod foot.

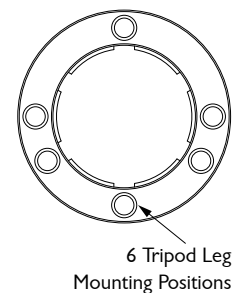
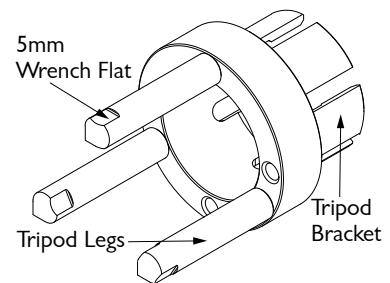


Leg Arrangement of Tripod foot for CA Model

The optional tripod foot for the CA Model that comes with a Tripod Support Bracket and three Tripod Legs. The Tripod Bracket allows the user to move/customize the leg position to accommodate their specific work piece.

The legs can be loosened with a 5mm or adjustable wrench at the provided wrench flats and relocated as required.

Note: The Tripod Bracket and legs are a self tensioning design. Only tighten the Tripod Leg until it comes in contact with the Tripod Bracket. Do Not Over Tighten.

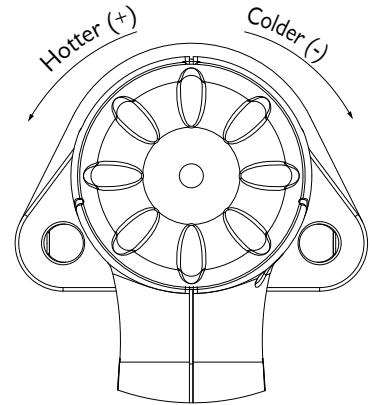
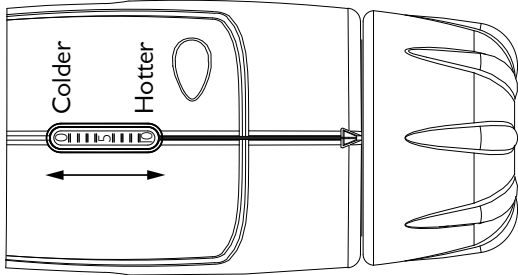


INSTALLATION & SET-UP

ADJUSTING WELD PARAMETERS

Adjusting Spring Force

Turn the rear knob clockwise to increase spring force and counter-clockwise to decrease spring force. A clear indicating window with an indicator light is provided to indicate spring compression for multiple setup applications.



Please refer to the power supply manual for recommended voltage and spring pressures.

CONNECTING TO A POWER SUPPLY

Hooking the weld tool to a stud welding power supply is straight forward. There are three steps:

Weld Tool

1. Connect the weld cable.
2. Connect the control cable.

Ground Cable

3. Connect the weld ground.

Weld Cable

The weld tool cable inserts in the following way. Line up the rectangular protrusion on the weld cable with the notch on the top side of the panel receptacle (typically the weld cable goes into the negative (- weld tool) receptacle). Push the weld cable connector straight in as far as it will go [Step 1]. Hand turn clockwise to tighten [Step 2]. See Figure 2.

Weld Ground

The ground cable is connected in the same fashion as the welding tool weld cable. The ground cable typically is inserted into the positive (+ ground) receptacle for straight polarity welding.

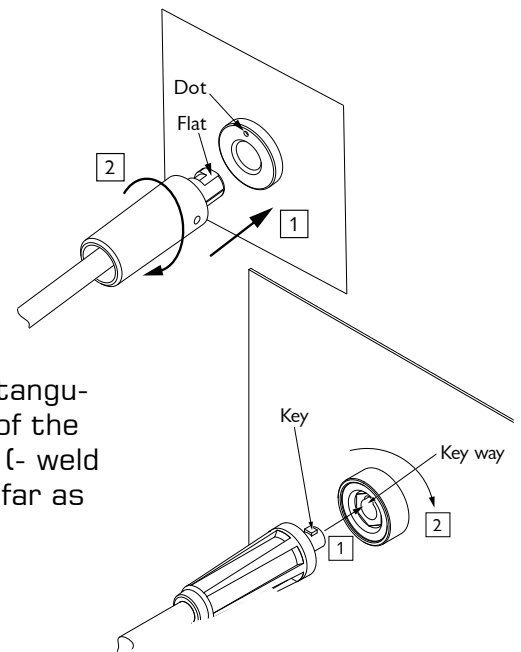


Figure 2

INSTALLATION & SET-UP

CONNECTING TO A POWER SUPPLY

Control Cable

There is a key in the end of the control cable connector. Align the key in the cable connector with the key way in the front panel control cable receptacle. Push the cable connector into the front panel receptacle [Step 1]. When the two are seated turn the screw ring on the cable connector clockwise [Step 2]. This will lock the two together. See Figure 3. The screw ring does not need to be overly tight.

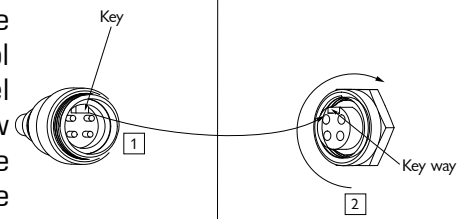


Figure 3

There are 3 basic types of connections. Connecting the control cable will vary with the style of the control cable that is on your new gun.

1. Screw Style which mates to Duro Dyne Equipment.

2. R&S (4 pins)

Align the bump on the shell of the connector with the relief in the receptacle. Push the cable connector firmly into the receptacle.

To remove, twist the outer shell of the cable connector counter clockwise. While holding the shell in a counter clockwise position pull the connector straight out.

3. Hubble (2 pin)

To connect a 2 pin style connector, line up the wide tab with the wide slot. Push forward on the connector when the connector housing contacts the receptacle turn the connector body 1/8 turn clockwise.



WARNING

WARNING: To prevent accidental activation of the weld tool, always disconnect the weld cable from the power supply before making any weld tool adjustments or performing any service on the weld tool.

Cable Connections

Straight Polarity: In straight polarity the weld tool is connected to the negative (-) electrode. The ground lead is connected to the positive (+) receptacle (often ground). This cable arrangement is the preferred arrangement for welding ferrous metals with either the gap or contact processes.

Reverse Polarity: Reverse polarity reverses the weld tool and ground connections. The weld tool connects to the positive (+) receptacle and the ground cable connects to the negative (-) electrode. This cable arrangement is preferred for welding materials such as aluminum, brass or galvanized with either the gap or contact processes.

Layout: The cables must be laid out straight. If the cables are coiled the amount of energy available for weld will be reduced. This will result in poor quality welds. This is true for both the weld tool weld cable and the ground cable when using either the gap or contact processes.

NORMAL OPERATION

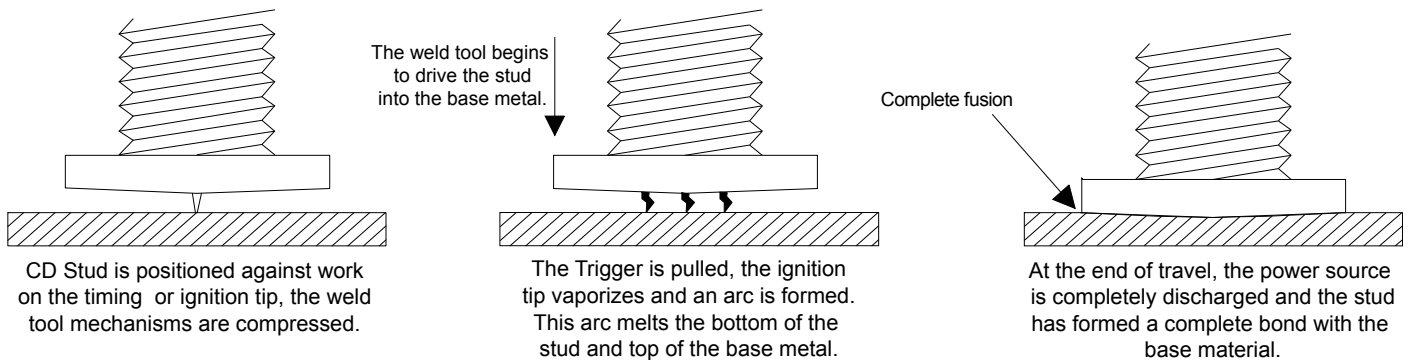
STUD WELD TOOL FUNCTIONS

The stud weld tool automates the stud welding process. It performs several key functions:

1. It holds the stud.
2. It holds the spark shield or tripod foot.
3. It controls the welding parameters

STUD WELDING STEPS

1. Place the stud to be welded into the weld chuck.
2. Position the end of the stud onto a location where the stud is to be welded.
3. Press the weld tool downward so the spark shield, template adapter or tripod legs are sitting on the work piece.
4. Ensure the stud is perpendicular to the base metal.
5. Pull the trigger to begin the weld sequence.
6. Hold the weld tool still during the welding process.
7. Remove the weld tool from the welded stud. Be sure and pull the weld tool straight off of the welded stud to prevent damage to the weld collet.



CONTACT CAPACITOR DISCHARGE PROCESS

Note: The tip design/dimensions are very important. The ignition tip controls the arc length and weld duration. If the ignition tip is too short there will not be enough weld time to ensure an adequate weld.

It is important NOT to use a centerpunch mark for the tip location. The tip will fall into the impression left by the center punch tool. This effectively shortens the ignition tip length and will most likely create a bad weld.

NORMAL OPERATION

WELD QUALITY (VISUAL INSPECTION)

Too Hot

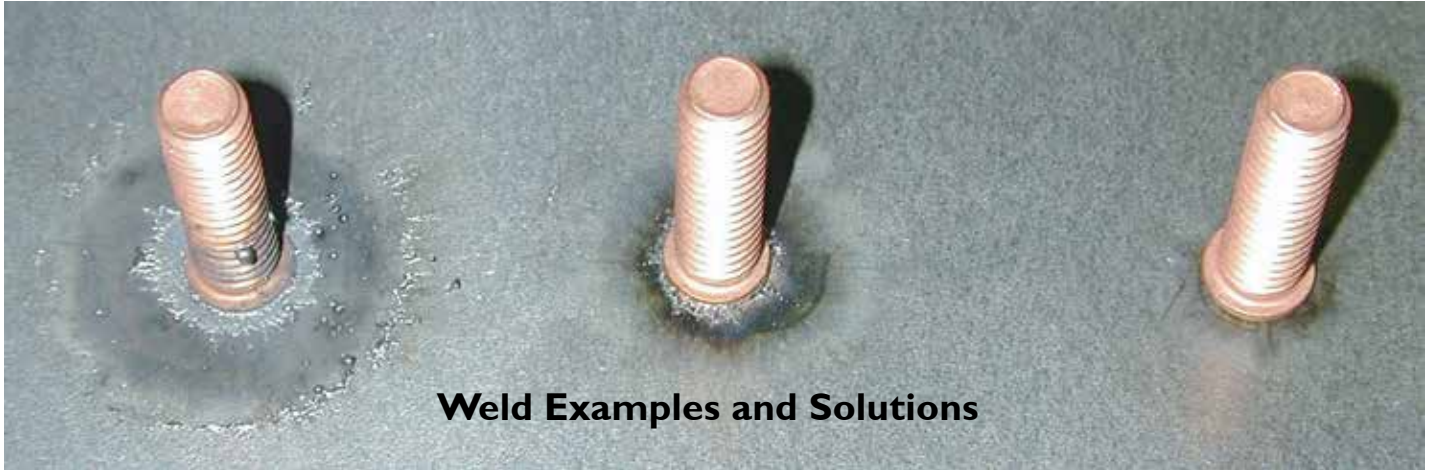
Excessive weld flash
and weld spatter.
This weld may break.

Correct

Normal weld flash.
No significant weld spatter.
This will be a good, strong weld.

Too Cold

No excessive weld flash
and weld spatter.
This weld may break.



Weld Examples and Solutions

Reduce Voltage
Increase Spring Pressure

No Adjustments Required

Increase Voltage
Reduce Spring Pressure
Also could be caused by a
short tip or center punch mark

TROUBLE SHOOTING

PROBLEM: COLD WELD	
Possible Cause	Possible Solutions
Tip on stud is crushed due to excessive pressure. Sometimes (especially with aluminum studs) an operator can apply repeated pressure to the stud tip and crush or shorten the tip. The shortened tip reduces arc length/time and does not properly melt the stud and or base material.	Reduce spring pressure. Refer to Adjusting Weld Parameters in Section 2 of the Operation Manual. Turn spring adjustment to a lower number setting.
Coiled weld or ground cables. This reduces weld current delivered to the stud. The coiled cables act like a large inductor and inhibit the flow of energy.	Make sure weld and ground cables are laid out straight during the stud welding process.
Tool heat setting is set too high. Higher heat setting prematurely extinguishes the weld arc.	Reduce heat setting. Refer to Adjusting Spring Force in Section 2 of the Operation Manual. Turn the heat adjustment knob to number 1.
Improperly set power supply controls.	Refer to the Operation Manual for the equipment for correct setup of power supply. Increase weld voltage.
Use of a center punch mark.	When the tip of the CD stud is located in a center punch mark, the overall length of that tip is reduced. This will result in cold welds. Contact your Duro Dyne Representative for ideas on creating a location mark if it is required.
Tip improperly formed manufacturing process.	Replace stud with a correctly formed ignition tip.
Changes in alloys being welded.	Changes in alloys can usually be compensated for by changing the settings on the power supply.
Internal weld tool components are dirty or have failed.	Return weld tool to Duro Dyne for service.
Incorrect plunge setting.	Increase gap distance which increases the drop speed and gets the stud into molten pool faster. See Section 2 for Plunge Adjustments.
Dirt inside weld tool causing malfunctions.	Return weld tool to Duro Dyne for service.
Equipment failure.	Refer to the Operation Manual for the power supply for this information.

PROBLEM: HOT WELD	
Possible Cause	Possible Solutions
Tool heat setting is set too low. Lower heat settings allow the arc to burn longer.	Increase heat setting. Refer to Adjusting Weld Parameters in Section 2 of the Operation Manual. Turn the spring adjustment to a lower number
Improperly set power supply controls.	Refer to the Operation Manual for the equipment for correct setup of power supply. Decrease weld voltage.
PROBLEM: WELD SPLATTER PREDOMINANTLY ON ONE SIDE (ARC BLOW)	
Possible Cause	Possible Solutions
Incomplete or insufficient grounding	Double Ground. The addition of another ground on opposite sides of the weld area will reduce this problem. The objects to weld between the grounds.
Welding near the edge (1/4 inch or less) of a piece of metal	Place another piece of sheet metal of the same type and thickness next to the edge you are welding. This will "fool" the electrical currents and they will act like you are welding in the middle of the sheet metal.
PROBLEM: SLIDING STUDS	
Possible Cause	Possible Solutions
The operator is pushing down with a great deal of pressure and/or is holding the gun at a slight angle.	Check the plunge setting. Use a minimum plunge that provides acceptable welding results. This will reduce the amount of pressure the operator needs to use to weld the stud. Also check the foot or nose piece to ensure that it is flat and provides a stable surface for welding.
The chuck is worn. This will allow the stud to be at a slight angle and can allow the set up to slide during the weld process.	Check the chuck for wear and replace if needed.
The weld tool internal components are excessively worn.	Contact your Duro Dyne Representative for possible repair or replacement.

SYSTEM MAINTENANCE

WHEN IS MAINTENANCE REQUIRED?

Maintenance requirements will vary with environment and usage. Dirty work areas or high volume stud welding will require more frequent maintenance.

There are three prime reasons for maintenance:

1. Dirt. Dirt can enter the lifting mechanism and cause erratic plunge operations. Typically, cleaning is all that is required.
2. Wear. Components do wear out over time. Typically, items such as the plastic bearings or cables wear out and need to be replaced.
3. Improper Use. Components can arc out by inadvertently placing them against grounded materials during a weld sequence.

Maintenance Steps

Because the weld tool components are in a sealed housing the recommended maintenance procedure for this weld tool is to return it to your distributor or manufacturer for service.



WARNING

WARNING: To prevent accidental activation of the weld tool, always disconnect the weld cable from the power supply before making any weld tool adjustments or performing any service on the weld tool.

PARTS LIST

27087	CCD Weld Gun Complete
27088	CCD Ground Clamp Complete
27082	CCD-CDMF Foil Weld Tip
27083	CCD-CDMF Standard Weld Tip



MACHINERY DIVISION

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