

Ready Welder II

OPERATION MANUAL

BATTERY / DC POWERED PORTABLE MIG WELDER
AND SPOOL GUN



MODELS

- | | |
|------------|---------------|
| ■ 10000 | ■ 10000-CS |
| ■ 10000ADP | ■ 10000ADP-CS |
| ■ 10250 | ■ 10250-CS |
| ■ 10000MDP | ■ 10000MDP-CS |

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READY WELDER II

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FOR ADDITIONAL ASSISTANCE, CONTACT US AT (800) 465-9184

WARRANTY INFORMATION

This Limited Warranty supercedes all previous RW-II warranties and is exclusive, with no other guarantees or warranties expressed or implied.

Your RW-II is warranted to be free from defects in material and workmanship for a period of one year from the date of the original purchase (proof of purchase required). This warranty covers only failures due to defects in material or workmanship which occurs during normal use and does not cover damage which occurs in shipment or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, or modification of the product, or damage that is attributable to acts of God.

The warrantor shall not be responsible for any incidental or consequential damages resulting from the use of this product, or arising out of any breach of this warranty. All express and implied warranties, including the warranties of merchantability and fitness for a particular purpose, are limited to the applicable warranty period set forth above.

IMPORTANT NOTICE: Certain states do not allow the exclusion or limitation of incidental or consequential damages or limitations to the length of an implied warranty, therefore the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

SAFETY

READ THESE WARNINGS - PROTECT YOURSELF AND OTHERS

BE AWARE, SERIOUS INJURY OR DEATH MAY RESULT if welding or cutting equipment is not properly installed, used, and maintained. Misuse of this equipment and other practices can be both hazardous and dangerous to the operator and any persons in the general work area. The operator, supervisor, and helper must read and understand the following safety warnings and instructions before installing or using any welding or cutting equipment.

The welding and/or cutting process is used in many potentially dangerous and hazardous conditions. In environments such as elevated heights, areas of limited ventilation, close quarters, around water, uncertain power sources, in hostile environments, etc., it is important that the operators are aware of the dangers and limitations associated with working in these types of conditions. Only properly trained and experienced operator(s) trained in safe practices for the environments in which they are expected to work and are under competent supervision should use this welder. It is essential that the operator, supervisor, and others in the work areas are aware of the dangers of the welding or cutting process. Training and supervision are both important and necessary for a safe work place. Please keep these instructions for future use and reference.

BE AWARE, THE FOAM IN THE RW-II CASE IS FLAMMABLE

Make sure the case is a sufficient distance from welding and cutting activity and is closed to avoid sparks, slag, or any hot material from coming in contact with the foam.

ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH

Install and maintain equipment in accordance with the National Electric Code NFPA 70 and local codes. Do not service or repair equipment with power on or batteries connected. Do not operate equipment with protective insulators or covers removed. Service or repair to equipment must be done by qualified and/or trained personnel only.

Operator should not and must not contact electrically live parts. Do Not touch electrode with bare skin and electrical ground at the same time. Always wear dry welding gloves in good condition. Be aware aluminized protective clothing can become part of the electrical path. Keep oxygen cylinders, chains, wire ropes, cranes, hoists, and elevators away from any part of the electrical path. All ground connections must be checked periodically to determine that they are mechanically strong and electrically adequate for the required current. When welding is to be suspended for any sustained period of time, such as during lunch or overnight, the READY WELDER II should be **disconnected from its arc current power source** when not in use. Never immerse MIG guns, electrode holders, TIG torches, plasma torches, or electrodes in water.

SAFETY [continued]

BE AWARE, ARC RAYS, HOT SLAG AND SPARKS CAN AND DO CAUSE INJURIES TO EYES AND SKIN

The welding and/or cutting processes produce extreme localized heat and strong ultraviolet rays. Never attempt to weld and/or cut without proper welding equipment, including, but not limited to, a welding helmet with the proper lens, which complies with federal guide lines. A number 12 to 14 shade filter lens on the helmet provides the best protection against arc radiation. Please note that in a confined area prevent the reflected arc rays from entering around the helmet. It is important to make sure others are protected from arc rays and sparks. Approved shielding curtains and/or appropriate goggles should be used by all persons working in the close vicinity of the welding area to provide protection to others in the surrounding area and operators of nearby equipment. Skin should and must also be protected from arc rays, heat and molten metal. The operator must always wear protective gloves and clothing which will not allow skin to become exposed. All clothing pockets should be closed and cuffs sewn shut. Leather aprons, sleeves, leggings, etc. should and must be worn for out-of-position welding and/or cutting. High top work shoes provide adequate protection from foot burns; for added protection, use leather spats. Flammable hair products should not be used when welding and/or cutting. Where the work permits, the operator should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide, an important factor for absorbing ultraviolet radiation, and lamp black, or shall be enclosed with non-combustible screens similarly painted.

BE AWARE, WELDING SPARKS CAN AND DO CAUSE FIRES AND EXPLOSIONS

Causes of fire and explosions are: combustibles reached by the arc, flame, flying sparks, hot slag or heated materials. Remove combustible materials and items from the work area and/or provide a fire watch. Avoid oily or greasy clothing as a spark may ignite them. It is necessary and required that the operator have a fire extinguisher nearby and have knowledge and training in its use. Be aware and alert to the danger of conduction or radiation. For example, if welding and/or cutting is to be done on a metal wall, partition, ceiling or roof, precautions must be taken to prevent ignition of combustibles on the other side. Do not weld and/or cut containers that have held combustibles. All hollow spaces, cavities and containers should be and must be vented prior to welding and/or cutting to permit the escape of air or gases. Purging with inert gas is recommended. Use only inert gases or inert gas mixes as required by the process. Use of combustible compressed gases can cause explosions resulting in personal injury or death. Arcing against any compressed gases can cause explosions resulting in personal injury or death.

SAFETY AND OPERATION REFERENCES

1. Code of Federal Regulations, (OSHA) Section 29 Part 1910.95, 132-134, 251-254 and 1000. U.S. Government Printing Office, Washington, D.C. 20402
2. ANSI Z49.1 "Safety in Welding and Cutting"
3. ANSI Z87.1 "Practice of Occupational and Educational Eye and Face Protection"
4. ANSI Z88.2 "Standard Practice for Respiratory Protection", American National Standard Institute, 1430 Broadway, New York, NY 10018
5. AWS F4. 1 "Recommended Safe Practices for Welding and Cutting Containers", The American Welding Society, 550 NW Lejeune Road, P.O. Box 351040, Miami, FL 33135
6. NFPA 51B "Fire Prevention in Cutting and Welding Processes"
7. NFPA-7 "National Electrical Code" National Fire Protection Association, Battery Park, Quincy, MA 02269
8. CSA Standard W117.2 "Safety in Welding, Cutting and Allied Processes" Canadian Standards Association, 178 Rexdale, Ontario, Canada M9W 1R3

FREQUENTLY ASKED QUESTIONS

Below you will find answers to the most “frequently asked questions” regarding RW-II, the DC Powered MIG Welder / Spool Gun. If you have any additional questions, call us at (800) 935-3644 between 8 AM and 5 PM PST on week-days. We hope this information will help you to obtain the highest level of satisfaction from your RW-II.

1. How long of welding duration time will I get out of a pair of batteries before I will need to recharge them? Many factors will determine the length of acceptable quality welding duration time, with the primary factors being the type and size of batteries used and the type of welding being performed. The thicker the metal being welded the greater the amperage draw will need to be to obtain satisfactory results, which will drain the batteries faster. The size and amp hour ratings of the batteries used will determine the total amount of power available and thus the welding time available. We recommend a deep cycle gel cell battery, like Optima Batteries offers, or at least a group 31 marine deep cycle battery as a power source for the Ready Welder II. A fully charged pair of these batteries will normally yield a minimum duration of about 45 minutes when welding 1/2” steel or 3/4” aluminum @ approximately 175 amps, while lighter duty welding operations on thinner metal can offer a duration time of 4 hours or more. Please see the operating guidelines in your Owner’s Manual for more battery discussion.

2. What type of batteries and charger should I buy, and what type of maintenance do I need to perform on the batteries? We highly suggest the purchase and investment of good quality 12DCV deep-cycle marine or RV batteries, ranging from group 24 to group 31, which is our preference. Our recommendation is Optima Batteries, they have a few deep cycle options to choose from. Their gel cell batteries will give you reliable power and a longer life. If you get one with vertical posts capped with wing-nuts, you will have easy power connections to the RW-II. Regular auto batteries and other batteries not designed for deep cycle discharging and recharging will have a shorter life span if drawn too low too many times, for occasional or recreational welding this shouldn’t be a problem. For home use, a 10 amp overnight charging will work well. Maintenance of batteries should be according to manufacturer’s instructions.

3. Does the trigger control power to the tip? Depends on which model you are speaking of. If it is a model with a “-CS” at the end of the model number, then the answer is YES, IT DOES. The cold switch upgrade includes a solenoid system integrated into the cable of the gun near the quick disconnects. This solenoid system is designed as a safety switch only, and does not affect any other function of the RW-II. On the non-CS models, the trigger controls wire feed (on-off) and gas flow, as the -CS models, but does not control power feeding to the tip. The tip is live whenever the RW-II is connected to power source. The red plastic connectors in the RW-II power cable are designed to be easily disconnected to de-power the welder between uses without having to disconnect the cables at the power source.

4. Does the wire feed speed control knob adjust the amperage level fed to the electrode? The wire feed speed control knob indirectly affects amperage based upon the speed and physical volume of wire being fed to the bead. The amount of wire fed to the bead is directly proportional to the ultimate amperage level delivered to the weld. The diameter of the feed wire will also affect the total amperage level delivered to the welding bead. The larger the wire the hotter it will burn as with the faster the feed rate the hotter the weld.

5. I’ve got two 12 volt batteries under the hood of my vehicle. Can I hook up the RW-II to these with the motor running and battery cables still connected? No, it is not recommended as batteries are normally wired in 12V parallel for these applications (except 24V equipment) and the RW-II prefers a minimum of 18V for welding metal thicker than thin sheet metal, which means the two batteries must be wired in series to yield 24V. Leaving the batteries connected to the vehicle’s electrical system while you’re operating a RW-II may cause severe damage to the vehicle’s electrical components. Many auto parts stores sell “quick disconnect” battery terminals which come in handy for these types of situations. Please isolate the batteries electrically from the vehicle when welding, and especially when welding on the vehicle itself using flux-cored wire, as this operation uses positive ground.

6. Can I connect the RW-II to my Arc or MIG Welder to use a “spool gun” attachment? Some RW-II models include an AC/DC power supply to power the circuitry of the gun. It is only required when connected to CC/stick welders and was specifically designed for these types of applications. However, it is recommended for use when connecting to CV MIG machines as well. While using the AC/DC power supply provided, the RW-II can safely be used with any DC output welding machines. Do not connect the RW-II directly to constant current welding machines without the use of the AC/DC power supply. **The power supply must be connected in the same polarity as the arc current.** The use of the power supply is not mandatory when connecting to CV machines with output ranging from 18V to 40V DC, or batteries.

IMPORTANT OPERATING TIPS

In order to obtain the best possible performance and service life from your new RW-II, we recommend that you read and practice the following operating tips:

1. SAFETY - Never open the RW-II if it is connected to a live power source!

Opening the case halves while the gun is powered will likely cause severe damage to the circuit board and other parts inside the RW-II. This damage will not be covered by the warranty. Also, never leave the power connected to the RW-II when you are not actually welding as the tip stays "hot" at all times, except with "-CS" models, when the power remains connected. Always disconnect the RW-II from the power source when not in use.

2. Power Connections for the RW-II

The RW-II comes with battery clamps which can be mounted onto the 3/8" copper lugs (hardware provided). Whenever possible it is preferable to make your power connections using the 3/8" copper lugs mounted directly to the battery terminals. Many deep-cycle batteries come with additional threaded post terminals, with wing-nuts on them, which are ideal for making these connections. The battery clamps are convenient to use but may restrict current flow and should therefore only be used when use of the 3/8" lugs is not feasible. Always securely attach the copper lug(s) to appropriate connection points directly on the welding machine itself if possible. **Never connect the RW-II to AC Output Terminals on arc welding machines.**

3. Battery Selection

Battery selection is a crucial part of successful RW-II operation. The size and power ratings of the batteries selected will have a great effect on the duration of welding time and the depth of penetration possible. For welding metal 1/8" and thicker, the larger the batteries the better. Deep cycle marine batteries are recommended, with threaded terminal posts topped with wing-nuts, in group sizes of 24D to 31D. Gel-Cell batteries from Optima work extremely well, but can require a special charger. Keep your batteries charged over 80% between uses to extend their life-span. Thin metal in general, and thin aluminum in particular, requires much lower amperage levels to be welded successfully than thicker metals. Sometimes the use of a single 12 volt battery with .030"-.035" aluminum wire, and the proper gas mixture, will weld thin aluminum sheet. Normally the use of 18 volts, from connecting 12 volt and 6 volt batteries together in series, are necessary to weld thin steel, aluminum or stainless steel. Thinner wire conducts less electricity, so it is helpful to use thinner wire (.023") on thin metal and thicker wire (up to .040") when welding thicker metal. When using 12 volts the use of thicker wire may be helpful as it allows more current to flow at the lower voltage.

4. Clean Metal Surfaces

The metal surfaces to be welded together should be clean and free from any "mill scale" deposits found on most steel products as they come from the foundry. Grinding the surfaces to be welded down to shiny bare metal will greatly improve the strength and penetration of the weld. Because MIG welding is an electrical process, any action taken which improves the conductivity of the metal being welded will improve the final results. This also applies to the surface to which the large "grounding clamp" is connected to as well. Make sure the ground clamp is attached to clean, bare metal on the piece being welded. Remember, the cleaner the surfaces welded, the stronger the weld.

5. The "RW-II Applications Table"

This manual contains the "RW-II Applications" Chart (page 21). Successful welding with the RW-II can be achieved if you follow the guidelines shown in this chart, especially as it directly relates to POLARITY. Flux core wire requires reverse polarity (red light) ground positive, while solid wire (all metals) requires straight polarity (green light) ground negative and the use of an appropriate gas mixture, as specified. When using the AC/DC power supply supplied with RW-II, the LED's no longer indicate arc current polarity but simply reveal that the RW-II circuit board is being powered. The AC/DC power supply must be connected in the same polarity as the arc current. The small red pigtailed included with the system will allow for the AC/DC power supply to be hooked up in reverse polarity.

6. Lever Tension Spring Settings

The lever tension spring adjuster selector should normally be left in the "Steel" slot for proper wire feed tension for .035" wire. Use of .023" wire may sometimes require that the selector spring be moved to the "Extra Grip" slot setting, while thicker wires may require use of the "Aluminum" slot setting. Select the firmest setting which still allows the wire to feed freely without causing the motor to bog down or the wire feed rate to be inconsistent.

THIN METAL WELDING

When attempting to weld metal thinner than 1/8" with the RW-II, we recommend the following guidelines.

POWER CONTROL GUIDELINES

- 1. Determine the Minimum Voltage You Can Use In The Given Situation.** Some thin sheet metal can be welded with 12VDC from a single battery. Two 6 volt deep cycle batteries connected in series can yield up to approximately 15VDC. The use of 18 volts DC, obtained by connecting a 6 volt battery in series with a 12 volt battery, will provide enough arc current to weld all metals with a thickness of 1/8" or less but be aware it can get hot enough to cause melt through.
- 2. Use the Smallest Diameter of Feed Wire Available of the Type Desired.** The smaller the diameter of wire the less current it can conduct, therefore use the smallest diameter feed wire you can in any given application to cool down the bead to reduce melt-through. Solid steel, stainless and Aluminum wires come in .023" diameter and will require the use of gas. Flux core wire comes in .030", typically as a minimum.
- 3. Use Increased Wire "Stick-Out" Length to Cool the Bead.** The greater the distance from the end of the contact tip to the bead, the greater the resistance faced by the arc current. Increasing wire "stick-out" works best with flux cored wire since you will not be concerned about keeping any shielding gas focused on the bead area.
- 4. "Stitch Welding" Mode.** The use of this mode of welding should allow you to successfully weld thin sheet metal at a 24 volt power level without melt-through problems. By producing a series of small, cooler beads, rather than a continuous bead, the stitch mode process prevents the bead area from getting hot enough to melt the surrounding metal. To use this process, turn the RW-II's wire feed speed control knob to the "off" position and then slowly advance it until the electrode wire just starts to feed slowly out of the contact tip. Release the trigger and cut off the excess wire which has been fed out. Aim the RW-II at the thin metal you wish to weld and pull the trigger while allowing for the maximum acceptable amount of wire "stick-out". Keep the RW-II's trigger pulled during the entire stitch mode welding process. When the feed wire makes contact and creates a small bead, the feed wire will momentarily melt back to the point that the arc is broken. The feed wire will feed out to the point that another bead is started where the previous bead ended. Repeat this process of connecting small, sequential beads until the job is complete. By using the maximum wire "stick-out" you can reduce the likelihood of wire "burn-back" clogging the contact tip.
- 5. Increased External Resistance.** This will lower the output and can be done in several different ways such as longer cable, smaller cable or by attaching a piece of chain to the work piece and adjusting the ground clamp up or down the chain, be aware that increased resistance causes greater heat!

WIRE SPOOL INSTALLATION

The Ready Welder system is shipped virtually ready-to-use as its name implies. The only preparation required is to load the RW-II welding gun with a wire spool. Wire cutters, and a flat head screw driver are the only tools needed.

Wire Loading Guidelines

Before opening the RW-II case halves to load a wire spool, be sure to disconnect the gun from any "live" power sources, including the AC/DC power supply if so equipped. The RW-II comes equipped with quick disconnects in its power cord to make this process quick and easy without the need to disconnect the power leads at the batteries or welding machine. Failure to follow this rule can lead to personal injury and cause could cause damage to the RW-II gun which will not be covered under the warranty as this would constitute user negligence. Before loading any wire spool be sure that the wire selected is suitable for the task at hand. Please refer to the chart on page 21.

Control Functions

The RW-II's primary user controls consist of a trigger and a wire feed speed control knob. There are also LED indicator lights just ahead of the wire feed speed control knob which indicate arc current polarity with battery power hook-ups (and with machine hook-ups when no AC/DC power supply is being utilized). When using the RW-II supplied AC/DC power supply to power the RW-II circuit board and motor, the LED light will indicate only that the AC/DC power supply is powered and is properly connected to the RW-II. Arc current polarity is NOT indicated by the LED's when the AC/DC power supply is being utilized. The power supply must be connected in the same polarity as the power source. The small red pigtailed included with the system will allow for the AC/DC power supply to be hooked up in reverse polarity.

LOADING THE READY WELDER II

1



Remove the T-Bolt handle (turn counter clockwise).

2



Lift top half of case from spool end first to allow the retainer clip securing the case halves at the tip end to disengage. Remove nozzle and insulator, then remove gas diffuser and tip; this will make loading the wire much easier.

3



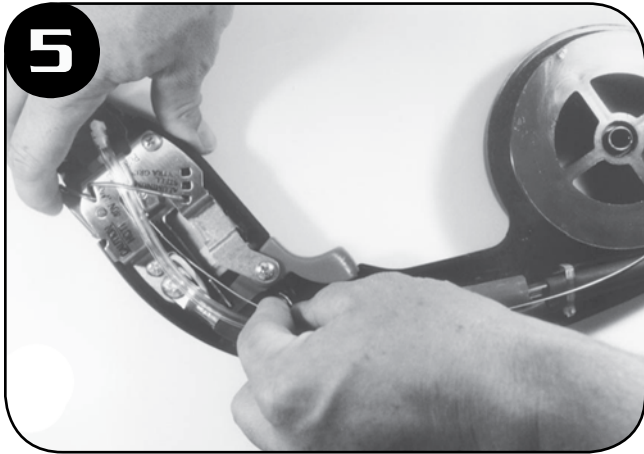
Select wire to be used. Unroll a few inches of wire, making sure to hold the coil firmly to prevent “bird nesting”. Clip off the end of the wire, leaving 3 to 4 inches of straight wire.

4



Place the spool in the housing of the gun, being sure to hold the wire firmly. Press the red tension lever and insert the wire between the rollers into the slot. Be sure to feed the wire parallel to the flat surface of the brass bracket. The wire should feed quickly and easily.

5



Install the gas diffuser and tip. Then, reinstall the nozzle cup and insulator. This will prevent accidental arcing.

CAUTION: ALWAYS DISCONNECT THE GUN FROM THE POWER SOURCE AND LET IT COOL DOWN BEFORE OPENING THE CASE FOR ANY REASON!

CAUTION: ONCE THE WELDER IS CONNECTED TO THE POWER SOURCE, THE CIRCUITRY IS LIVE, AS WELL AS THE GUN TIP ON NON-CS MODELS. BE VERY CAREFUL NOT TO ACCIDENTALLY GROUND TIP TO ANYTHING WHEN THE WELDER IS CONNECTED!

6

WELDING ALUMINUM WITH THE RW-II

GENERAL POINTS FOR THE READY WELDER II

When welding aluminum, be sure to use a contact tip which is .005 larger than the wire diameter itself, and extend the nozzle out approximately 3/8", this helps reduce burn back (i.e. melting the wire in the tip). As aluminum conducts heat so rapidly, some users find it preferable to increase the wire speed and move more quickly across the metal being welded, especially on thin aluminum of 1/8" and less. Please consult the chart on page 21.

Preheating aluminum over 1/4" to approximately 250° F., is a widely recognized practice and helps on the start of the bead while increasing the penetration. Using a heat sink steel plate on the back side of aluminum can help prevent burn through. Please note: When welding, thin aluminum wire will help to reduce the voltage and amperage. See thin metal guidelines on page 5. When welding on 1/8" thick aluminum or less, the travel rate must be faster than on steel and movement must be similar to drawing a line on a piece of paper. When the wire speed is adjusted correctly there should be no spatter and the weld process should be very quiet, similar to the sound of a gas leak. HINT: The proper travel is to push with aluminum usually right to left if you're right handed and left to right if you're left handed.

BIRD NESTING

The RW-II has been used for many years with great success. However, we do know that some users are more successful than others. Bird nesting may occur when wire stick out makes contact with grounded surface. **Very important to remember that the wire is electrically hot when there is power to the RW-II unit, unless equipped with the CS option.** This means that if the aluminum wire extending out of the contact tip comes in contact with the grounded work; it will burn back and weld into the contact tip. Taking this condition into consideration may eliminate some frustration and excessive use of contact tips. The following suggestions should provide information to make welding aluminum easy using the RW-II spool gun. As with all installations of weld wire, and especially aluminum, be sure that the Ready Welder is NOT connected to any welding power source (batteries or DC welding machines). Once the aluminum wire is installed, install the gas diffuser and contact tip, and then trim any excess wire flush to the nozzle. To avoid excessive tip replacement and arc flashing, it is important to remember to pull away from the grounded work just prior to releasing the spool gun trigger when concluding a weld.

READY TO WELD WITH ALUMINUM

You are now ready to establish an arc and weld aluminum. Depending on the thickness, and mass of aluminum to be welded, a slight pre heat in the area where you are going to start will help provide a uniform weld bead. Your welding position should be with a slight tilt of the spool gun into the direction of the travel; this is called the forehand technique. When you are ready to establish the arc, hold the gun nozzle about 1/4" away from the grounded work piece. Slowly depress the gun trigger to start the flow of argon shield gas. Now pull the gun trigger and establish the weld. The weld wire should burn off slightly above the grounded work piece. If excess spatter and a cracking sound are detected, slow the wire speed just slightly until it smoothes out to a quiet smooth running arc. If you are welding lighter gauge aluminum, increasing travel speeds will help avoid burning through. In some cases reducing power to 18VDC, a 12 and 6 volt battery in series, will also make it easier to weld.

We know that welding aluminum is not easy for the inexperienced welder, it can also be different for those welders that are not familiar with the RW-II. There are many satisfied RW-II owners doing an excellent job with welding aluminum, as it is one of it's key features. With a little practice, you will be successful at welding aluminum. If you have any questions or technical assistance, just call us at (800) 935-3644 or email techsvc@readywelder.com.

SETTINGS FOR WELDING ALUMINUM

The suggested settings for the RW-II with batteries are as follows; Three charged 12 volt batteries in series will provide plenty of power for heavy, thick, and large aluminum welding jobs. Two 12 volt batteries in series will provide up to 275 amps for most jobs. One 12 volt and one 6 volt battery works well on 1/8" or thinner aluminum. Wire sizes .023" - .030" should be used for thinner sections and .035" - .040" is for heavier sections of aluminum.

When connections are completed and you are ready to begin welding, set the spool gun speed control to 50%. Then adjust as required, remember, wire size will also have an effect on the welding current.

On DC stick electrode machines; be sure that the AC/DC power supply is plugged into a 115V AC outlet and is connected to the RW-II cable assembly prior to hooking to the CC power source. Because there are a large variety of these machines, we find it important to understand that wire size and current settings need to be carefully evaluated, for example, an .023" aluminum wire may require as little as 80-100 amps, so you must make adjustments to the wire speed and machine settings to get the desired amperage.

Aluminum wire size .030" usually requires a minimum of 130 amps, and the .035" wires may require a minimum of 150 amps, if possible adjust the voltage and wire speed to match the wire size being used.

OPERATION

Duty Cycle

Unlike conventional welders, which are limited in how long they can weld because of heat build-up, the RWII has a 100% duty cycle when shielding gas is being used. The use of flux-core wire with high amperage levels will require cooling periods, however the welder can be cooled rapidly with compressed air. When operating from direct current drawn from batteries, there are no power source components to overheat. The system can be operated continuously for as long as the batteries can deliver power. As always be sure to leave a small gap between the back end of the nozzle and the plastic face of the gun, so heat will not be directly transferred into the plastic and cause damage to the RW-II.

Using the MIG Gun

RW-II can use a number of types and sizes of welding wire, some shown in the Application Chart on page 21. One of the major advantages of the RW-II is the ability to control the speed of the wire directly from the gun. Wire speeds can range from 50 inches per minute for lighter work to 900 inches per minute for heavier jobs, this speed selection is done using the RW-II speed selector knob. The Application Chart lists various metals that can be welded using the RW-II, and includes recommendations for wire, gas tips, and various system settings to be used.

CONNECTING YOUR RW-II

BATTERIES

Batteries are an excellent power source for welding, as this is pure DC power. Two 12 volt batteries connected in series will produce 24VDC, and will provide up to 275 amps of power with .040" wire, to single pass up to 1/2" plate. At 36VDC, the RW-II will pull up to 350 amps to penetrate 3/4" material. The RWII will, under the correct circumstances, make an ideal thin metal welder using 12VDC. Larger wire has less resistance 12 volts, so the RW-II should be able to weld 18 to 24 gauge metal using .035" wire. The opposite is the rule for 24 volt power, as you decrease the wire size down to .023", this will increase the resistance to help reduce the output power. By adjusting the gas mixture and voltage, the RW-II will adjust to a spray transfer process. Deep cycle marine batteries have a longer discharge/recharge life over standard batteries. However, welding performance will be the same with either type of battery.

Model 10000/10000-CS

Connect two 12 volt batteries in series by connecting the positive terminal of battery #1 to the negative terminal of battery #2. This set up provides the necessary 24 volts. For all gas shielded wires use standard polarity (green LED light). Connect the lead (gun) to the positive terminal on battery #2 and the ground to the negative terminal of battery #1. Again the green polarity light indicates proper standard polarity. For flux core, self-shielded, wire use negative polarity (red LED light) with the gun lead connected to the negative terminal of battery #1 and the ground connected to the positive terminal of battery #2. See illustration on page 12.

Model 10000ADP/10000ADP-CS

Connect to batteries as described above, except you will need to connect the small black wire from the jacket of the cable to the small red wire connector on the negative side of the red plug, this will then complete the circuit of the motor. See illustration on page 12.

Model 10250/10250-CS

This model is not shipped from the factory with a ground cable or a battery series cable. The user must supply both of these items for battery connection. Connect the batteries in series as described before, connect the RW-II lug to the open positive and the ground to the open negative. Connect the small jumper wire equipped with the mini clamp to the negative with the ground to complete the motor circuit. This set up is for welding with gas, straight polarity (green LED light). Reverse the leads for flux core wire, no gas, reverse polarity (red LED light). See illustration on page 13.

CONNECTING YOUR RW-II [continued]

DC/CV POWER SOURCE

Constant Voltage (CV) MIG machines also make an excellent power source for the RW-II. The voltage control on these machines will directly affect the welding power. The wire speed will also have an effect on the power, i.e. the faster the wire feed the higher the amp draw. It is not required to use the AC/DC power supply supplied with these machines, but if the power supply is used, it must be connected in the same polarity as the arc current. The RW-II will be controlled by the voltage control on the machine.

Model 10000/10000-CS

Connect the RW-II positive lug to the positive output stud on the machine, or you can connect to any part of the roller block, if needed. Then connect the negative lug of the RW-II to the negative post of the machine. Connect the RW-II ground clamp to the work piece, and close the contactor on your machine. Some models require you to close the contactor by closing the existing MIG gun switch/trigger, this can sometimes be accomplished by jumping the contactor if the machine has a 7 or 14 pin connector on the front. Be sure to release the drive roll tension if there is wire in the machine. See illustration on page 16.

Model 10000ADP/10000ADP-CS

Connect as described above, except connect the small black wire from the jacket to the small red wire on the negative side of the red plastic connector. See illustration on page 16.

Model 10250/10250-CS

Connect the RW-II lug to the positive output on the machine or to one of the bolts on the roller block, connect the small clamp to the connector from the jacket of the RW-II and to the negative post in the machine or anywhere along the machine ground. Connect the machine ground to the work piece. Again, some machines require you to close the contactor by closing the existing MIG gun switch/trigger, this can sometimes be accomplished by jumping the contactor if the machine has a 7 or 14 pin connector on the front. Be sure to release the drive roll tension if there is wire in the machine. See illustration on page 16.

DC/CV ENGINE DRIVES

Model 10000/10000-CS

Connect the RW-II positive lug to the positive output stud on the machine and connect the machine ground to the negative lug of the RW-II for straight polarity. Reverse the connections for reverse polarity. Then connect the RW-II ground clamp to the work piece.

Model 10000ADP/10000ADP-CS

Connect the same as described above except, you will need to connect the small black wire from the jacket to the small red wire on the negative side of the red connector and be sure the machine is set on constant voltage (CV).

Model 10250/10250-CS

Connect the RW-II lug to the positive output on the machine then connect the small clamp to the connector from the jacket of the RWII and to the negative post on the machine or anywhere along the machine ground. Connect the machine ground to the work piece. Be sure the machine is set on CV.

DC/CC ENGINE DRIVES AND STICK MACHINES

All stick welding machines are constant current (CC). These machines can be difficult to adjust to, at first, as the initial voltage spike causes the wire to burn back readily. However, once you have mastered the technique it should be easy to repeat. These power sources will weld aluminum and flux core wire but generally will not have the sustained voltage to run hard wire. Always start with a higher wire speed and adjust down until the arc appears to "dial in". The machine will drop from approximately 80 volts to the mid 20 volt range after the initial arc is struck. It is imperative to use the AC/DC power supply supplied with the RW-II and it must be connected in the same polarity as the arc current. Gas welding is DC+ or ground negative (green LED light), and flux core is DC- or ground positive (red LED light). Change arc polarity as you would with a welding rod.

Model 10000/10000-CS

These models are not suitable for constant current machines, it can be upgraded at the factory for a fee to include the AC/DC power supply and its proper connections.

CONNECTING YOUR RW-II [continued]

Model 10000ADP/10000ADP-CS

Connect the positive RW-II lug to the stinger and the negative RW-II lug to the ground clamp of the machine. As normal, the RW-II can also be directly connected to the positive and negative posts. It is imperative that you use the AC/DC power supply to drive the gun controls, these connections must be in the same polarity as the arc current. See illustration on page 15.

Model 10250/10250-CS

Connect positive RW-II lug to the stinger or directly to the positive output on the machine. It is imperative that you use the AC/DC power supply to drive gun controls, these connections must be in the same polarity as the arc current. See illustration on page 15.

Additional info when using the RW-II with constant current welding machines

In the electrical flow of welding current, DC stick electrode welding machines only offer a very narrow gap for making the Ready Welder useful. DC stick electrode welding current will provide adequate welding amps and volts to use **ONLY in a spray transfer process.**

This means that solid wires for steel or stainless steel must be used in a spray transfer process only. Therefore will not work with a short circuiting arc. Solid wires for steel and stainless steel must have a gas mixture of argon and oxygen. Typically, a 98% argon with 2% oxygen will do well. NOTE: Never use more than 5% oxygen in argon for both steel and stainless steel.

Aluminum using 100% argon gas is one of the only solid wire types that will be easy to use, because the constant current welding machines voltage is controlled with arc length. This means that the Ready Welder wire speed control becomes the voltage control for welding at a specific amperage. Copper/bronze wire types will also work well. Experience has taught us that when using a constant current DC stick electrode welding current for feeding wire from any wire feeder, the amperage setting should be set above 100 amps for .030 wires and voltage adjusted to burn the wire off just above the work piece. If a satisfactory setting cannot be achieved this way, then you will need to increase the amperage slightly by adjusting the wire speed until a satisfactory weld is accomplished.

As the wire size increases, the amperage on the machine will need to be set higher also. The following settings may be helpful with making the proper amperage settings.

.030wire, set amperage to 120 to 150 amps

.035wire, set amperage to 150 to 180 amps

.045wire, set amperage to 160 to 250 amps

It is important to remember that with solid wires, the proper connection will be with the RW-II ground lug on the negative terminal, with the Ready Welder connected this way, the green LED light should be on.

With using gasless flux core, the RW-II positive lug should be connected to the negative terminal and the RW-II ground connected to the positive terminal. The red LED light should be on for this setting.

Flux cored wires with gas will require the green light to be on and negative ground. Steel and stainless steel small diameter gas covered flux cored wires are available but must be used in a wind free environment.

IMPORTANT:

1. To compensate for the initial voltage spike on constant current machines (up to 80 volts) start with the wire stuck out of the tip 2 or 3 times more than usual to compensate for "burn-back". Pulling the mig nozzle out a little further will also build in extra stick-out. It helps to use the shorter 11 series contact tips, or to cut the 14 series tips shorter as needed. After the arc is struck, arc voltage drops to a manageable level. Before plugging the AC/DC power supply into the machine, be sure that the 110 volt outlet is AC power, some machines have a 110 volt DC outlet that will damage the RW-II AC/DC power supply. If the 110V outlet on the machine is DC, batteries can be used for powering the circuit board and motor. It may be possible to connect to the 12V battery that starts the engine drive, for this you will need to make up two wires that will plug into the connectors that the AC/DC power supply plugs into at the end of the RWII cable.

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2. With non-CS models, the RW-II does not have a contactor, which means the wire is live. Treat it like using a stick welder and do not ground the spool gun to the work surface. Additionally, fully depress the gun trigger when welding, otherwise when the wire contacts the work it will burn-back if the wire is not feeding.

MIG MACHINE AS THE RW-II POWER SOURCE

As stated, battery is the best source of power for the RW-II because it is pure DC and constant voltage. The second best is MIG because it offers DC/CV (constant voltage) power source.

You must remember that MIG machines have a contactor control which we need to close so that the MIG becomes the DC/CV power source for the RW-II. Several methods can accomplish this. The easiest is to tape or strap down the trigger on the MIG gun. When you turn the machine on you will hear the connector close. **NOTE: Everything that you do must be done with the power switch off.**

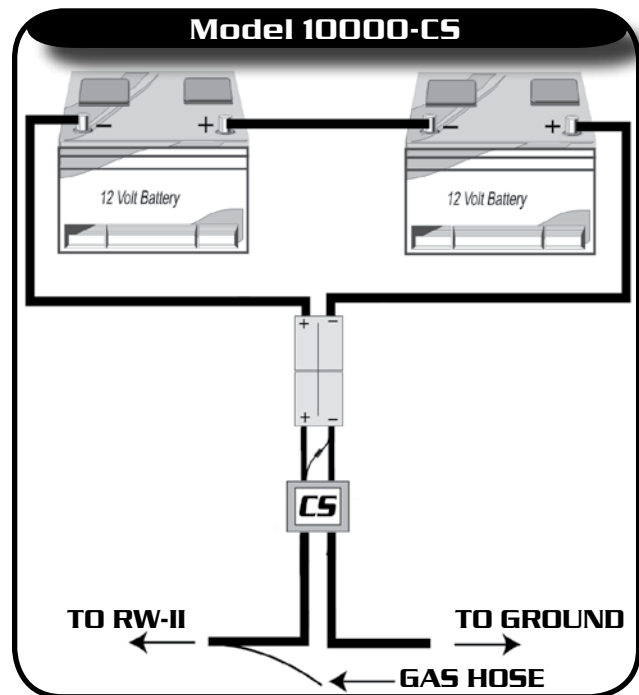
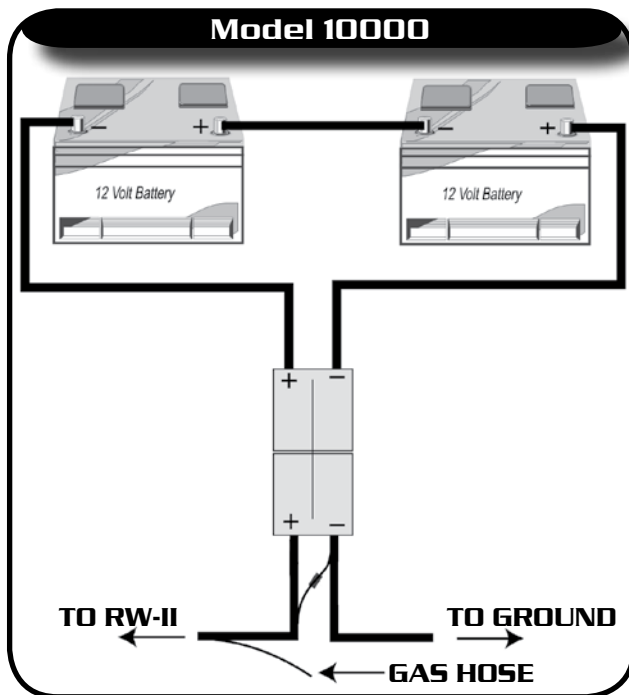
The next method is to follow the trigger leads from the end of the MIG gun to their attachment to the welder. Some connections are the (2) wires plugged in with simple solderless crimp on spade terminals. Unplug the terminals and make a jumper lead about 4" long with proper terminals, crimped on each end. Then plug these into the proper location. **NOTE: Remove the welding wire from the drive roller and turn wire speed control to "0", zero.**

Some MIG welders have actual plugs or amphenol plugs on the face of the machine. Unplug the trigger lead and there will be (2) male pins showing. Find the (2) female corresponding pinholes on the machine and with a short jumper wire, plug it into the pinholes.

If you would like to control the MIG drive motor during your use with the RW-II, you can install a toggle switch with either of these conversion methods and be able to turn off the MIG drive motor.

CONNECTION DIAGRAMS

Connecting To Batteries



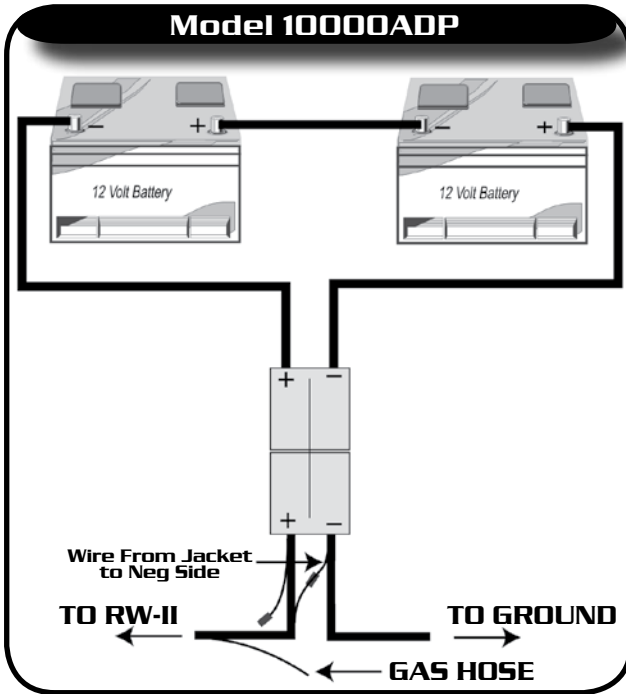
24VDC Battery Connection, Reverse Polarity, Red LED Light, Flux Core Wire

NOTE: Reverse Pigtail Leads for Straight Polarity, Green LED Light, Welding With Gas

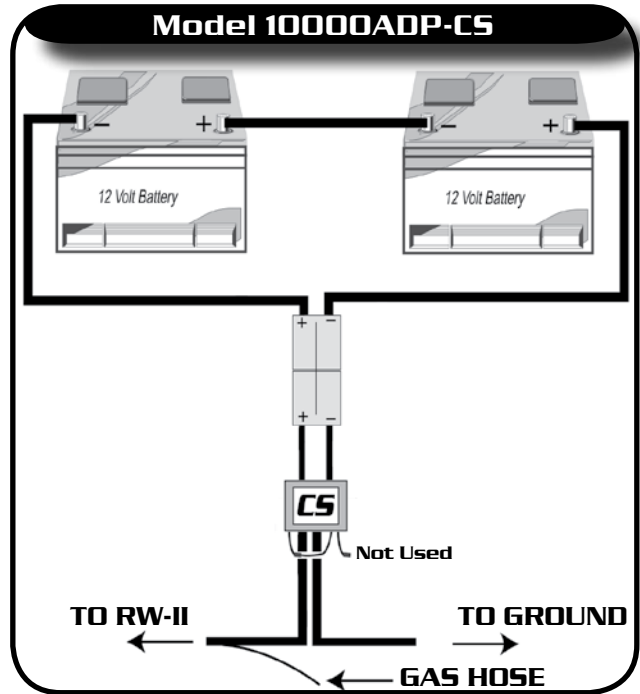
CONNECTION DIAGRAMS [continued]

Connecting To Batteries [continued]

Model 10000ADP



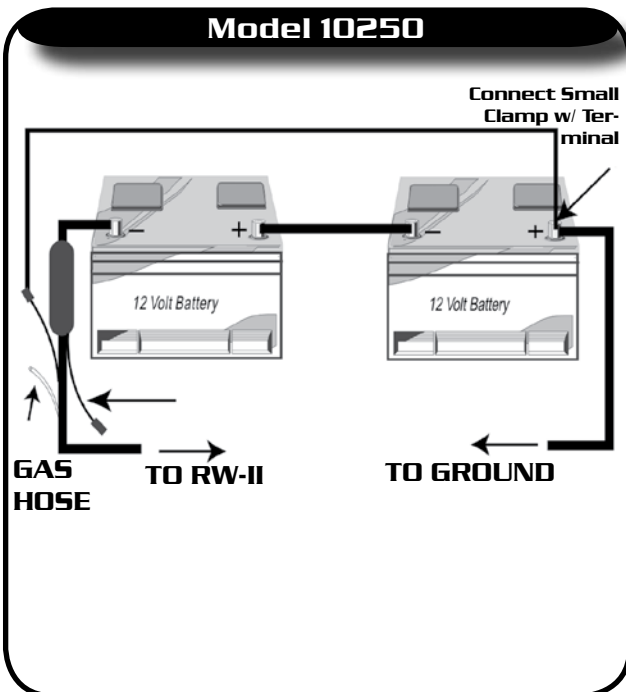
Model 10000ADP-CS



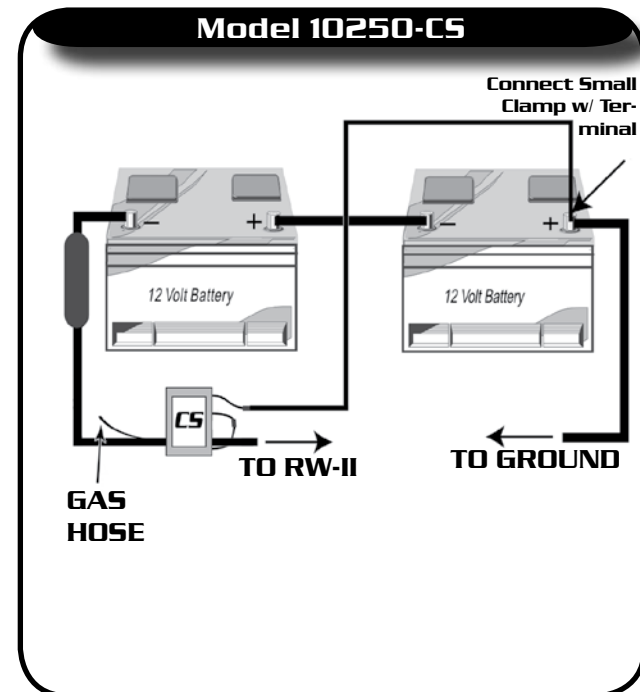
24VDC Battery Connection, Reverse Polarity, Red LED Light, Flux Core Wire

NOTE: Reverse Pigtail Leads for Straight Polarity, Green LED Light, Welding With Gas

Model 10250



Model 10250-CS



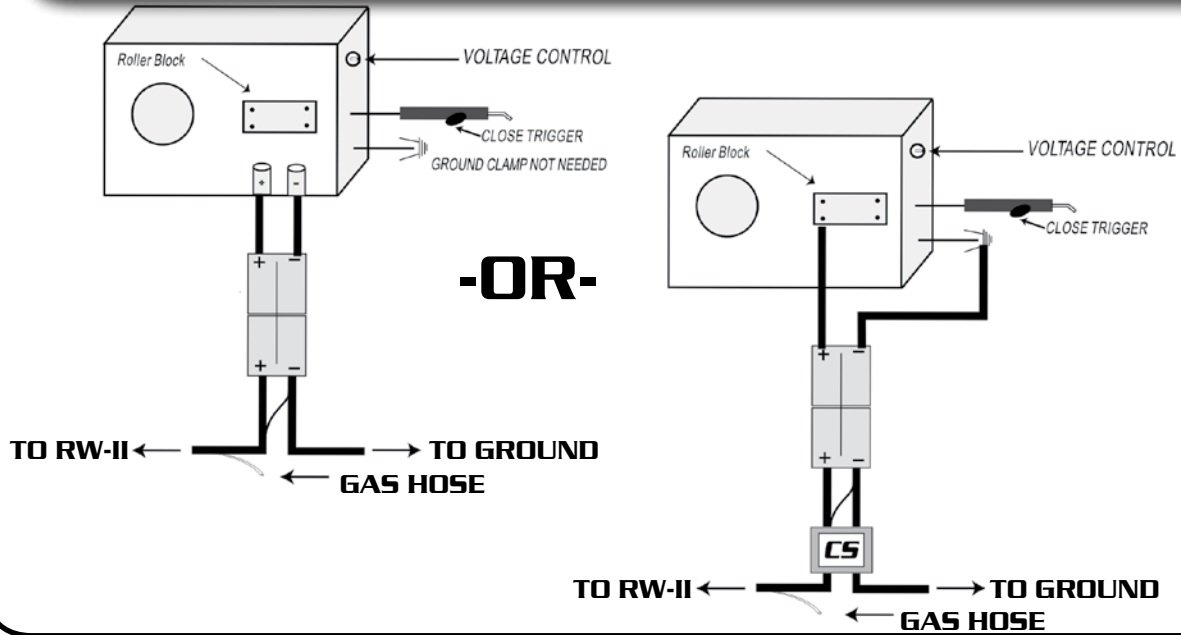
24VDC Battery Connection, Reverse Polarity, Red LED Light, Flux Core Wire

NOTE: Reverse Pigtail Leads for Straight Polarity, Green LED Light, Welding With Gas

CONNECTION DIAGRAMS [continued]

Connecting To A CV MIG Machine

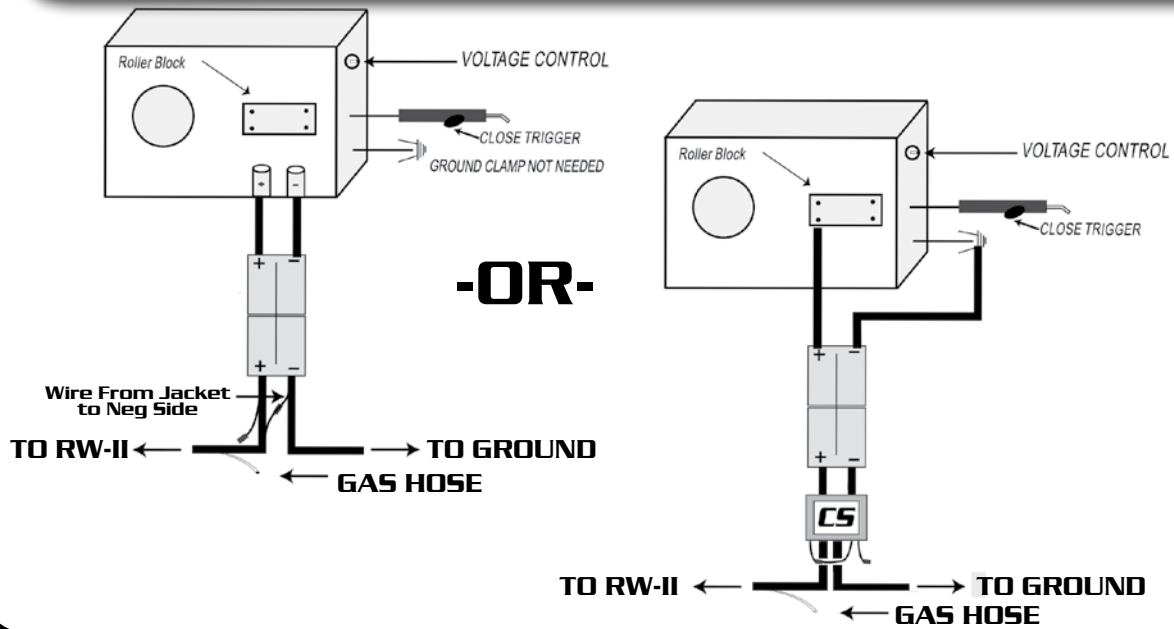
Model 10000 and 10000-CS



Straight Polarity, Green LED Light, Welding With Gas

NOTE: Reverse Pigtail Leads for Reverse Polarity, Red LED Light, Flux Core Wire

Model 10000ADP and 10000ADP-CS



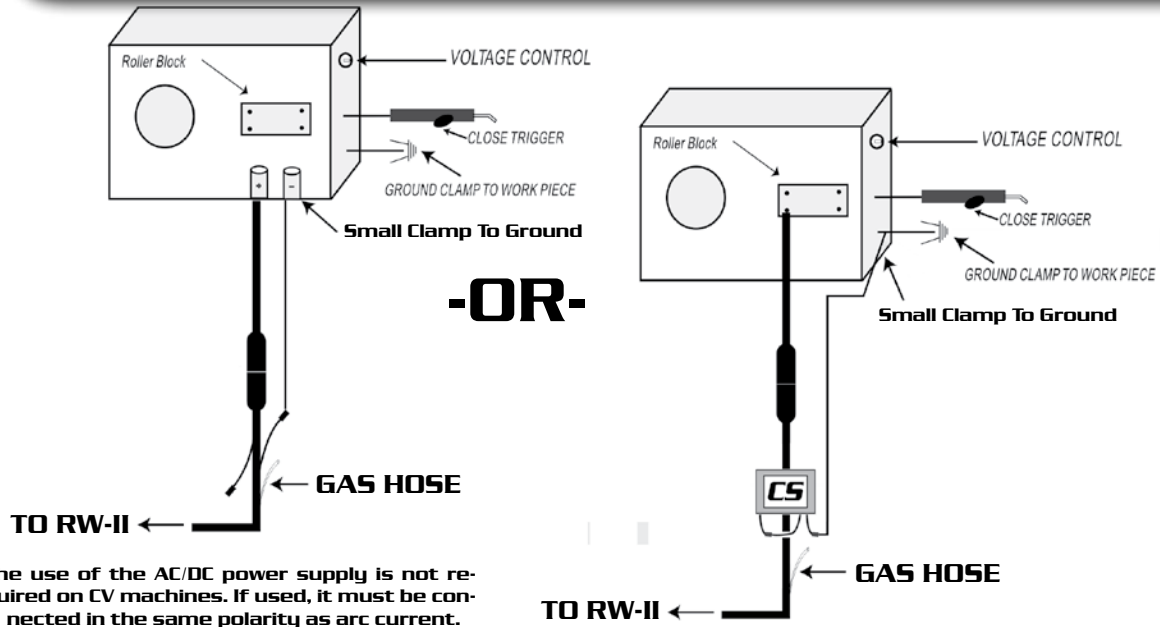
Straight Polarity, Green LED Light, Welding With Gas

NOTE: Reverse Pigtail Leads for Reverse Polarity, Red LED Light, Flux Core Wire

CONNECTION DIAGRAMS [continued]

Connecting To A CV MIG Machine [continued]

Model 10250 and 10250-CS

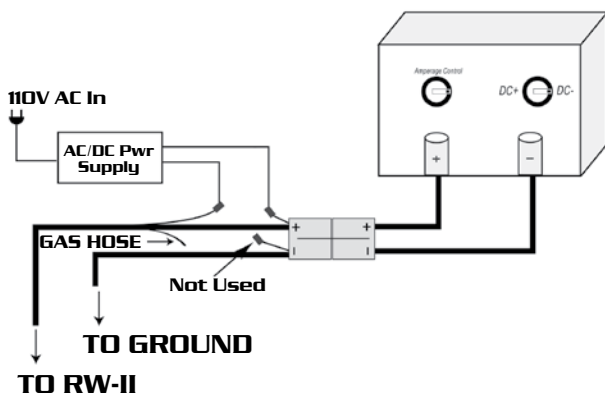


Straight Polarity, Green LED Light, Welding With Gas

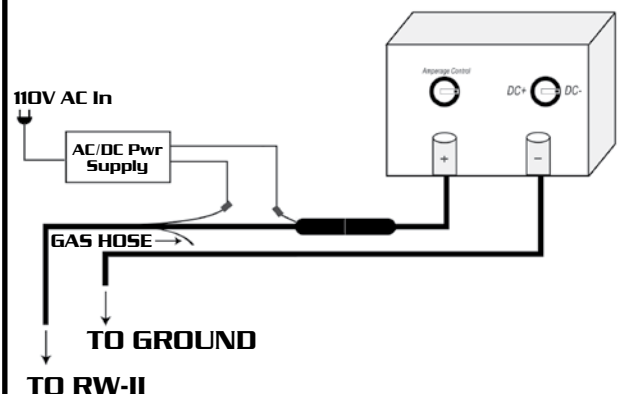
NOTE: Reverse Pigtail Leads for Reverse Polarity, Red LED Light, Flux Core Wire

Connecting To A CC Stick Machine

Model 10000ADP



Model 10250



Red LED Indicates Reverse Polarity, Green LED Indicates Straight Polarity

NOTE: The LED will only indicate AC/DC power supply polarity. Connect power supply wires to the same as arc polarity, to reverse polarity use small red pigtails included.

ROUTINE MAINTENANCE

RW-II Prevent:ative Maintenance Recommendations

1. Keep grinding grit from getting into the RW-II gun. Do not lay the RW-II down on dirty or gritty surfaces and set the gun down as far away from grinding activities and grit sources as possible.
2. Proper Lubrication of moving parts is essential to long life. We recommend the use of "Castrol Syntec" brand fully synthetic motor oil for all the lubrication needs of the RW-II. Be aware, use of petroleum based lubricants can adversely affect the gun body and gas valve action.
3. Regularly blow gun clean with compressed air or gas.

Battery Maintenance

To maximize the life of lead-acid, deep cycle batteries, always check the fluid level at least once a week and keep the level full. Recharge at 20 amp or lower settings and stop charging when the batteries reach full charge as excessive charging will boil and damage the batteries. Always keep the batteries fully charged between uses and the use of a "Battery Tender" device is recommended.

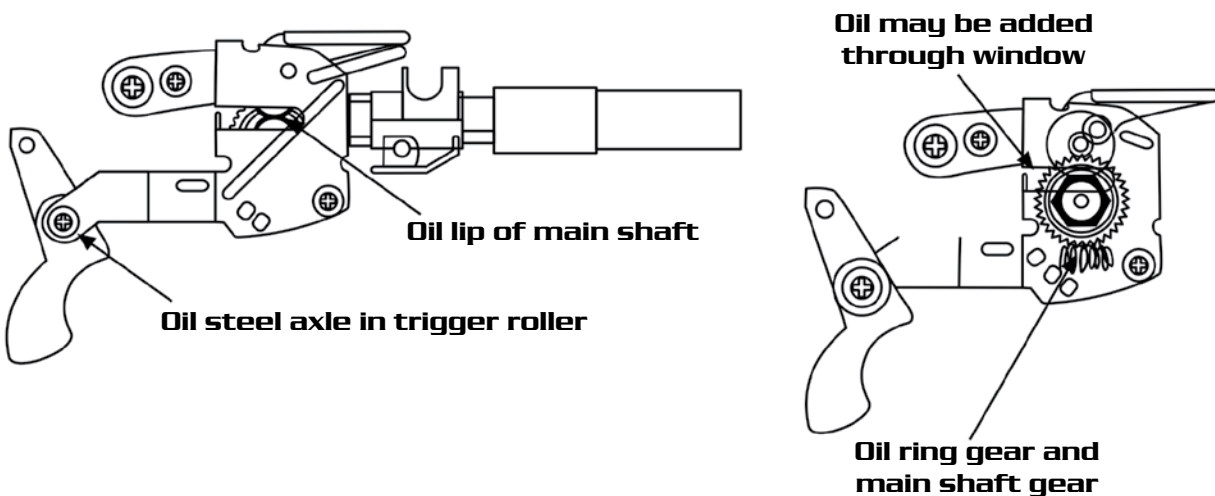
Replacing Tip Assembly Components

With use, the welding tips will need to be replaced intermittently. Recommended replacement tips are standard #2 Tweco tips or compatible. Dedicated tips should be used when welding various types of metal (i.e., do not use the same tip for welding aluminum and steel). When welding aluminum, be sure to use a contact tip which is .005" larger than the feed wire itself.

CAUTION: REMEMBER TO LET THE GUN COOL DOWN BEFORE REPLACING TIPS!

RECOMMENDED PERIODIC MAINTENANCE

The following diagram shows areas to be lubricated periodically.



NOTE: Do not get oil on surface of plastic roller and main shaft. Use silicon oil on gears and shafts. Oil all parts sparingly with a toothpick or a Q-Tip.

TROUBLESHOOTING

Trouble	Possible Problem	Possible Solution
Irregular Wire Feed or Motor Unable to Feed Wire	Wire Not Loaded Properly	Check for Binding
	Batteries Need Recharging / Maintenance	Charge or Maintain Batteries
	Contact Tip Clogged	Replacement Tip Needed
	Wire Feed Tension Spring Misadjusted	Tighten Tension Spring Setting
	Idle Roller Not Contacting Wire	Replacement Roller Needed
No Wire Feed	Improper Power or Ground Connection	Check All Connections
	No Power from MIG Machine	Close Contactor on MIG Machine
	AC/DC Power Supply Not Powered	Check AC/DC Connections
	Motor or Circuitry Damaged	Contact Ready Welder Corporation
	No Power to Wire Feed Motor	Verify LED is Lit & Check Connections
No Weld Output (Wire Feeds Normally)	Batteries Need Recharging / Maintenance	Charge or Maintain Batteries
	No Arc Power from MIG Machine	Close Contactor on MIG Machine
	Improper Power or Ground Connection	Check All Connections
	Arc Current Source Malfunctioning	Check Source for Output Problems
	Cold Start Solenoid Not Working (CS Models Only)	Contact Ready Welder Corporation
Poor Weld Quality	Batteries Need Recharging / Maintenance	Charge or Maintain Batteries
	Improper Power or Ground Connection	Check All Connections
	Contact Tip Clogged	Replacement Tip Needed
	Wrong Output Polarity Used	Check Application Table
	Wrong Feed Wire or Shielding Gas Used	Check Application Table

NOTE: Please contact READY WELDER CORPORATION, at (800) 935-3644, with questions regarding any mechanical or technical problems that you may encounter when using your RW-II.

READY WELDER II APPLICATION TABLE

Metal Type	Thickness of Material Being Welded	Wire Type/Size	Tweco #2 Tip Size	Shield Gas	Gas Flow Rate [Cu.Ft./Hour]	Polarity / LED Color	Wire Speed Control Setting
Steel	24 to 18 GA	Solid Steel .023"	.023"	75% Argon / 25% Co2	15 - 30	Straight / Green	Stitch
	18 GA to 3/16"	Solid Steel .030"	.030"	75% Argon / 25% Co2	15 - 30	Straight / Green	Stitch to 1
	1/8" plus	Solid Steel .035"	.035"	75% Argon / 25% Co2	15 - 30	Straight / Green	Stitch to 2
	1/4" plus	Solid Steel .040"	.040"	75% Argon / 25% Co2	15 - 30	Straight / Green	1 to 4
	22 to 14 GA	Flux-Core Steel .030"	.030"	None	None	Reverse / Red	Stitch to 1
	1/8" to 3/8"	Flux-Core Steel .035"	.035"	None	None	Reverse / Red	Stitch to 3
	1/4" to 1/2" plus	Flux-Core Steel .040"	.040"	None	None	Reverse / Red	3 to 6
Aluminum	.060" to 1/8"	Aluminum .023"	.030"	100% Argon	10 - 20	Straight / Green	1 to 2
	1/8" to 1/2"	Aluminum .035"	.040"	100% Argon	15 - 30	Straight / Green	2 to 6
	1/2" plus	Aluminum .040"	.045"	100% Argon	20 - 50	Straight / Green	4 to 9
Stainless Steel	.080" to 1/8"	Solid Stainless .030"	.030"	Tri-Mix*	20 - 40	Straight / Green	Stitch to 1
	1/8" plus	Solid Stainless .035"	.035"	Tri-Mix*	20 - 40	Straight / Green	1 to 6
	1/8" plus	Flux-Core Stainless .035"	.035"	None	None	Reverse / Red	1 to 6

Tri-Mix*: The specific mix of gases and their respective proportions will be determined by 1.) the alloy and thickness of the stainless steel being welded, and 2.) the alloy and thickness of the stainless welding feed wire being used. Please consult your welding gas distributor or an appropriate reference manual to determine the proper mixture for your application.

Note: The Polarity LED Indicator does not indicate arc current polarity when the RW-II supplied AC/DC power supply is being used. The power supply must be connected in the same polarity as the arc current.

Other General Guidelines

1. Stitch Mode Welding. When welding metal thinner than 1/8" with batteries as a power source, it is often necessary to use a stitch mode welding procedure to avoid melting the metal being welded. Start by lowering the wire feed speed control to its lowest setting where the wire just begins to feed. When you begin welding, a small bead will form and then the wire will melt back just enough to break the arc. The process will weld a series of small beads with short breaks of time between them. This prevents heat from building up and melting through, known as globular transfer.

2. Voltage Levels / Settings. When powering the RW-II with a welding machine, the machine will offer amperage control and/or voltage control. The RW-II works well on 12 to 40 DCV and on amperage between 30 to 300 amps. Dialing the proper power level with a machine as a power source is a simple task that requires a little experimentation. Power from batteries is controlled by different voltage combinations of 12V to 36V. The amperage is controlled by the wire size, wire speed and by external resistance such as longer and smaller cable. By hooking a 6V battery in series with a 12V battery you can obtain 18V, which will aid in welding metals thinner than 1/8" without melt-through. With metal thicker than 1/8", we recommend 24V for globular welding and 36V for spray transfer welding on metal 1/4" or thicker. On thinner metal it often takes a bit of experimentation to find the right combination of battery voltage, feed wire diameter, and wire feed speed to obtain the desired results.

3. Aluminum Welding. We recommend using a contact tip which is .005" bigger than the aluminum feed wire itself and pulling the nozzle about 3/8" farther out to reduce burn-back.

ASSEMBLY DIAGRAM

