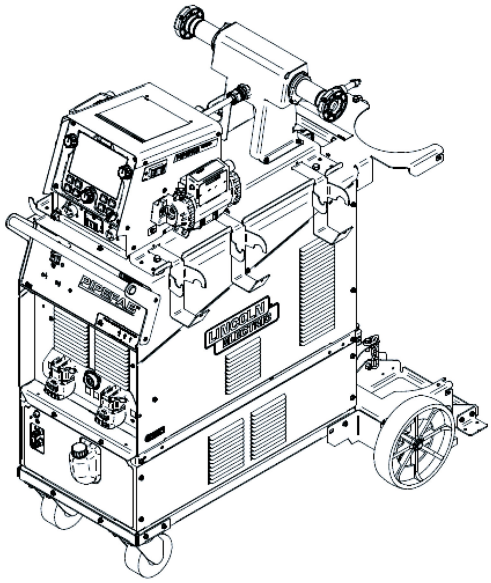
INSTRUCTION MANUAL

PIPEFAB™ WELDING SYSTEM



For use with Product/Code Numbers:

12858, 13010, 12929, 12938

Save for future reference

Date Purchased

Code: (ex: 10859)

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THE LINCOLN ELECTRIC COMPANY
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SAFETY INFORMATION

SAFETY DEPENDS ON YOU

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

⚠ DANGER

This statement indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

This statement indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

This statement indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

Notice: This statement indicates the possibility of damage to equipment if the potential risk is not avoided.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

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

KEEP YOUR HEAD OUT OF THE FUMES



- **DON'T** get too close to the weld. Use corrective lenses if necessary to stay a reasonable distance away from the weld.
- **USE ENOUGH VENTILATION** or exhaust at the weld, or both, to keep the fumes and gases from your breathing zone and the general area.
- **IN A LARGE ROOM OR OUTDOORS** , natural ventilation may be adequate if you keep your head out of the fumes.
- **USE NATURAL DRAFTS** or fans to keep the fumes away from your face.
- **READ** and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

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

WEAR CORRECT EYE, EAR AND BODY PROTECTION



- **PROTECT** your eyes and face with properly fitted and with proper grade of filter plate (See ANSI Z49.1).
- **PROTECT** your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.
- **PROTECT** others from spatter, flash, and glare with protective screens or barriers.
- **PROTECT** your eyes and face with welding helmet
- **IN SOME AREAS**, protection from noise may be appropriate.
- **BE SURE** protective equipment is in good condition.



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

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

- **DO NOT WELD, CUT, OR HEAT** painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.
- **PROTECT** compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.
- **BE SURE** cylinders are never grounded or part of an electrical circuit.
- **REMOVE** all potential fire hazards from welding area.



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

CALIFORNIA PROPOSITION 65 WARNINGS

⚠ WARNING



Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

Always start and operate the engine in a well-ventilated area.

If in an exposed area, vent the exhaust to the outside.

Do not modify or tamper with the exhaust system.

Do not idle the engine except as necessary.

⚠ WARNING



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

For more information go to https://www.p65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS

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

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

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

FOR ENGINE POWERED EQUIPMENT



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



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



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

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



- To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



- Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- Using a generator indoors **CAN KILL YOU IN MINUTES**.
- **NEVER** use inside a home or garage, EVEN IF doors and windows are open.



- **ONLY** use **OUTSIDE** and far away from windows, doors and vents.
- Avoid other generator hazards. **READ MANUAL BEFORE USE**.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and heating current creates EMF fields around cables and equipment.
- EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- Exposure to EMF fields in welding may have other health effects which are now not known.

All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

- Route the electrode and work cables together - Secure them with tape when possible.
- Never coil the electrode lead around your body.
- Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
- Connect the work cable to the workpiece as close as possible to the area being welded.
- Do not work next to welding power source.

ELECTRIC SHOCK CAN KILL



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

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

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.
- In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
- Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- Ground the work or metal to be welded to a good electrical (earth) ground.
- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- Never dip the electrode in water for cooling.

- Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- **Also see** WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION **and** FOR ELECTRICALLY POWERED EQUIPMENT

ARC RAYS CAN BURN



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

FUMES AND GASES CAN BE DANGEROUS



Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone.

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

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION



- Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to **“Safety in Welding and Cutting” (ANSI Standard Z49.1)** and the operating information for the equipment being used.

- When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to ensure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, **AWS F4.1** from the American Welding Society.
- Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuff-less trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- **Read and follow NFPA 51B** “Standard for Fire Prevention During Welding, Cutting and Other Hot Work”, available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- **DO NOT** use a welding power source for pipe thawing.

CYLINDER MAY EXPLODE IF DAMAGED



- Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a cylinder.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, “Precautions for Safe Handling of Compressed Gases in Cylinders,” available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

FOR ELECTRICALLY POWERED EQUIPMENT



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

BATTERY HANDLING, STORAGE, AND DISPOSAL



Batteries can be flammable substances such as lithium or other organic solvents, which may result in overheating, rupture, or combustion. Failure to follow the battery manufactures instructions may result in fire, personal injury, and damage to property if used improperly.

- DO NOT short circuit, disassemble, deform, or heat batteries.
- DO NOT attempt to recharge batteries unless they are specifically marked as "rechargeable".
- DO NOT use or charge the battery if it appears to be leaking, deformed or damaged in any way.
- Store in a cool location. Keep batteries away from direct sunlight, high temperature, and high humidity.
- Immediately discontinue use of the battery if, while using, charging, or storing the battery, the battery emits an unusual smell, feels hot, changes color, changes shape, or appears abnormal in any other way.
- Keep batteries out of reach of children, should a child swallow a battery, consult a physician immediately.
- Recycle or dispose of batteries in accordance with local and federal laws.

FOR LASER EMITTING EQUIPMENT



- Hazardous Class 4 (IV) laser products emit invisible, infrared laser radiation which can permanently damage the eye's retina and/or cornea, burn skin, and pose a fire risk. End users shall assign a qualified Laser Safety Officer (LSO) who has the certifications required by applicable law/standards, have a documented Laser Safety Program and have a Laser Controlled Area (LCA) that confirms to ANSI Z136.1 & Z136.9.
- Do not operate laser before end user's LSO has completed a risk assessment and all the prescribed Risk Mitigations measures have been fully implemented. Ensure the laser is operated/ demonstrated safely by trained personnel and that the environment surrounding the laser welding cell or laser-controlled area is safe for people nearby when the laser is in operation.
- Never point the laser at yourself or others. Never look directly into a laser aperture, even if wearing full eye protection.
- All persons inside LCA must wear proper PPE to avoid eye or skin exposure to laser radiation. The end user's LSO shall select proper PPE including, but not limited to, heat-resistant gloves, flame-resistant clothing, laser safety eye wear and laser-safe helmets that conform to ANSI Z136.1 Optical Density requirements for the wavelength and output power of the laser in use. Standard safety glasses and welding helmets DO NOT provide adequate protection from laser beam hazards. Always inspect PPE for damage or improper fit before use.
- Only qualified persons shall install, operate or service this unit per ANSI Z136.1 standards and your LSO's instruction. Read and follow all labels and manuals before installing, operating, or servicing hand held any laser welding equipment.
- Do not operate outside of a LCA, or if the laser protective housing is modified or damaged, or if safety interlocks have been bypassed or otherwise defeated. Inspect all equipment and LCA for damage or tampering prior to use.
- Reflected beams from the laser can damage eyes and skin and can pose a fire risk. Prior to use, the LCA should be assessed by the LSO to understand the surfaces where hazardous reflected beams can exist. Never position yourself or flammable material in the anticipated laser beam path and take extra precautions when working on reflective materials like aluminum and stainless steel.
- Follow all standards, individual facility or building regulations, and national, state, and local codes.

DEALER LOCATOR & PRODUCT REGISTRATION

Register your machine:

https://www.lincolnelectric.com/register

Authorized Service and Distributor Locator:

https://www.lincolnelectric.com/locator

ADDITIONAL SAFETY INFORMATION

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

WEEE



Do not dispose of electrical equipment together with normal waste! In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will protect the environment and human health!

INSTALLATION

TECHNICAL SPECIFICATIONS

PipeFab™ (K3731-1, K3732-1, K3734-1, K3735-1)

Table 1 :POWER SOURCE - INPUT VOLTAGE AND CURRENT

MODEL	DUTY CYCLE	INPUT VOLTAGE ± 10%	INPUT AMPERES	IDLE POWER	POWER FACTOR @ RATED OUTPUT
K3731-1	100% RATING	208 / 230 / 400* / 460 / 5 75 50 / 60 HZ **(INCLUDED 380 V TO 415 V)**	53 / 46 / 26 / 24 / 19	550 WATTS MAX. (FAN ON)	0.94
K3732-1					

Table 2 :WIRE FEEDER - INPUT VOLTAGE AND CURRENT

MODEL	COMPONENT	VOLTAGE	INPUT AMPERES
K3735-1	WIRE DRIVE	40 VDC	9 A
	USER INTERFACE	40 VDC	1 A

Table 3 :POWER SOURCE - RATED OUTPUT

INPUT VOLTAGE / PHASE / FREQUENCY	GMAW / FCAW	SMAW	GTAW-DC
	100%	100%	100%
380 - 415 / 3 / 50 / 60	400 AMPS 34 VOLTS	400 AMPS 36 VOLTS	400 AMPS 26 VOLTS
460 / 3 / 50 / 60			
575 / 3 / 50 / 60			

Table 4 :WIRE FEEDER - RATED OUTPUT

DUTY CYCLE	AMPERES	WIRE FEED SPEED	WIRE SIZES	
			SOLID	CORED
60%	450 AMPS	50 - 800 IN / MIN 1.3 - 20.3 M / MIN	.023 - 1/16 IN 0.6 - 1.6 MM	.030 - 5/64 IN 0.8 - 2.0 MM

Table 5 :RECOMMENDED INPUT WIRE AND FUSE SIZES [1]

INPUT VOLTAGE / PHASE / FREQUENCY	EFFECTIVE INPUT AMPERE RATING AND DUTY CYCLE	CORD SIZE [3]	TIME DELAY FUSE OR BREAKER [2]
		AWG SIZES (MM^2)	AMPERAGE
200 - 208 / 3 / 50 / 60	53 A, 100%	4 (25)	100
230 / 3 / 50 / 60	46 A, 100%	4 (25)	90
380 - 415 / 3 / 50 / 60	26 A, 100%	8 (10)	60
460 / 3 / 50 / 60	24 A, 100%	8 (10)	45

INPUT VOLTAGE / PHASE / FREQUENCY	EFFECTIVE INPUT AMPERE RATING AND DUTY CYCLE	CORD SIZE [3]	TIME DELAY FUSE OR BREAKER [2]
		AWG SIZES (MM^2)	AMPERAGE
575 / 3 / 50 / 60	19 A, 100%	10 (6)	35

[1] Based on U.S. National electrical Code.

[2] Also called “inverse time” or “thermal / magnetic” circuit breakers; circuit breakers that have a display in tripping action that decreases as the magnitude of the current increases.

[3] Type SO cord or similar in 30° C ambient.

Table 6 :AGENCY MARKINGS

MODEL	MARKET	CONFORMITY MARK	STANDARD
K3731-1	US AND CANADA	$_{C}CSA_{US}$	CAN / CSA E60974-1 ANSI / IEC 60974-1
K3732-1	US AND CANADA	$_{C}CSA_{US}$	CAN / CSA E60974-1 ANSI / IEC 60974-1
	EUROPE	CE	EN 60974-1
K3735-1	US AND CANADA	$_{C}CSA_{US}$	CAN / CSA E60974-5 ANSI / IEC 60974-5
	EUROPE	CE	EN 60974-5

MODEL	IP RATING
K3731-1	IP23
K3732-1	IP23
K3735-1	IP2X

Table 7 :WELDING PROCESS

PROCESS	OUTPUT RANGE (AMPERES)	MEAN OCV (UO)
GMAW	40 - 400 A	73 V
GMAW-P		
FCAW		
GTAW-DC	5 - 400 A	36 V
SMAW	55 - 400 A	63 V

Table 8 :PHYSICAL DIMENSIONS

MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
POWER SOURCE	30 IN (762 MM)	17.5 IN (444.5 MM)	34.8 IN (883.9 MM)	340 LBS. (154.2 KG)
PipeFab™ FEEDER	12.6 IN (320 MM)	19.7 IN (500 MM)	16.7 IN (424 MM)	54.5 LBS. (24.7 KG)
WIRE REEL STAND	13.8 IN (351 MM)	22.0 IN (559 MM)	28.2 IN (716 MM)	25.5 LBS. (11.6 KG)
PipeFab™ FEEDER AND WIRE REEL STAND	14.5 IN (368 MM)	22.0 IN (550 MM)	30.2 IN (767 MM)	80.0 LBS. (36.3 KG)
COMPLETE SYSTEM	53.2 IN (1351.3 MM)	30.9 IN (784.9 MM)	48.8 IN (1239.5 MM)	500 LBS. (226 KG)

Table 9 :TEMPERATURE RANGES

MODEL	OPERATING RANGE	STORAGE RANGE
POWER SOURCE	-4° F TO 104° F (-20° C TO 40° C)	-40° F TO 185° F (-40° C TO 85° C)
PipeFab™ FEEDER	-40° F TO 104° F (-40° C TO 40° C)	-40° F TO 185° F (-40° C TO 85° C)

IP23 - Insulation Class (F) 155° (C)

- Weight does not include input cord

SAFETY PRECAUTIONS

Read this entire installation section before operating machine.

⚠ WARNING



ELECTRIC SHOCK can kill.

Turn the input power OFF at the disconnect switch or fuse box before attempting to connect or disconnect input power lines, output cables or control cables.

Only qualified personnel should perform this installation.

Do not touch the wire drive, drive rolls, wire coil or electrode when welding output is ON.

Wire feeder may be connected to a piece of automatic equipment that may be remotely controlled.

Do not operate with covers, panels or guards removed.

Do not let the electrode or wire spool touch the wire feeder housing.

Insulate yourself from the work and ground.

Always wear dry insulating gloves.

The lift bail is insulated from the wire feeder enclosure. If an alternate hanging device is used, it must be insulated from the wire feeder enclosure.

⚠ WARNING



MOVING PARTS can injure.

Keep away from moving parts.

Wear Eye Protection.

SELECT SUITABLE LOCATION

The PipeFab™ will operate in harsh environments. Even so, it is important that simple preventative measures are followed in order to assure long life and reliable operation.

- The machine must be located where there is free circulation of clean air such that air movement in the front and back, out the sides and bottom will not be restricted.
- Dirt and dust that can be drawn into the machine should be kept to a minimum. The use of air filters on the air intake is not recommended because normal airflow may be restricted. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown.
- Keep machine dry. Shelter from rain and snow. Do not place on wet ground or in puddles.
- Do not mount the PipeFab™ over combustible surfaces. Where there is a combustible surface directly under stationary or fixed electrical equipment, that surface shall be covered with a steel plate at least .060" (1.6 mm) thick, which shall extend not less than 5.90" (150 mm) beyond the equipment on all sides.
- The PipeFab™ feeder is rated IP2X and is suitable for indoor use. For best wire feeding performance, place the PipeFab™ Feeder on a stable and dry surface.
- Do not submerge the feeder.

This equipment is for industrial use only, and it is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in residential locations due to conducted as well as radiated radio-frequency disturbances. The EMC or RF classification of this equipment is Class A.

LIFTING

Lift the machine by the lift bail only. The lift bail is designed to lift the power source only. Do not attempt to lift the power source with feeder or accessories attached to it.

When suspending a wire feeder, insulate the hanging device from the wire feeder enclosure.

STACKING

The PipeFab™ cannot be stacked.

TILTING

Place the machine directly on a secure, level surface or on a recommended undercarriage. The machine may topple over if this procedure is not followed.

For bench models, do not angle spindle for the wire spool or coil more than 15 degrees downward.

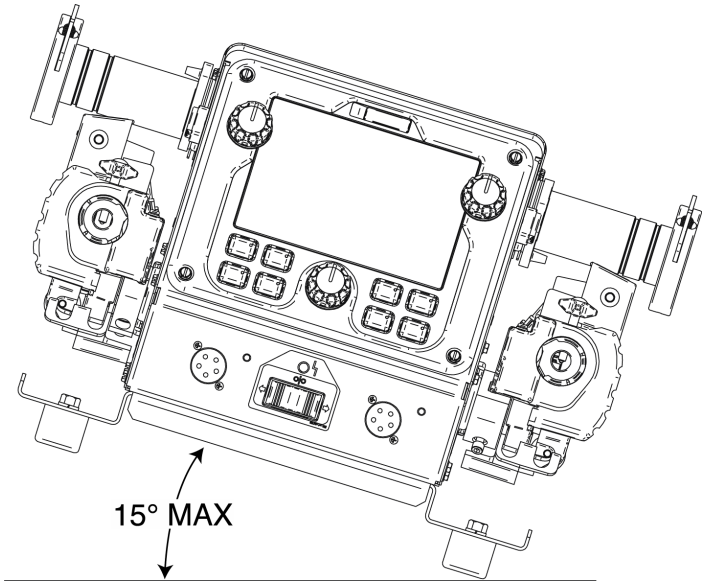


Figure 1 : TILTING

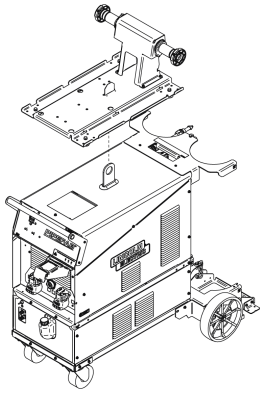
MECHANICAL INSTALLATION

All accessory kits such as the PipeFab™ Undercarriage Kit and PipeFab™ Cooler come with installation instructions. Consult these installation instructions before assembly.

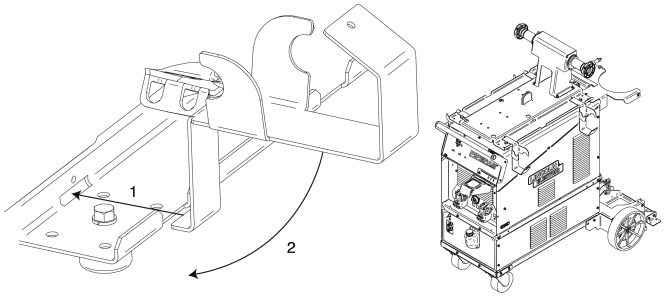
STANDARD (BENCH) CONFIGURATION

The PipeFab™ Feeder is installed on the PipeFab™ Power Source as shown in the steps below. The installation is the same whether the power source has the water cooler installed. In the below images, the water cooler is installed. Note that hardware is not necessary for the installation of the feeder. Hardware is included if desired.

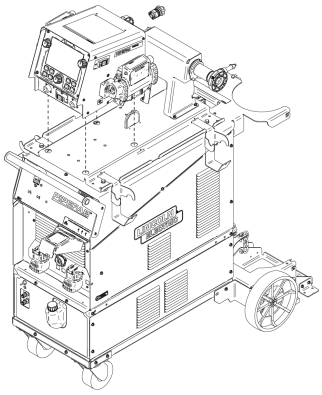
1. Position the Wire Reel Stand onto the Power Source. Ensure the lift bale is routed through the lift bale cutout and the Spindles are towards the rear of the machine.



2. Install the Cable Management brackets. There are six slots, and four brackets, so place them in your most desired configuration. To install the brackets, (1) place the tab into the slot and (2) rotate the bracket 90° until it rests against the Power Source.



3. Position the PipeFab™ Feeder onto the Wire Reel Stand. For secure mounting, ensure the feet of the feeder engage with the feet cutouts in the Wire Reel Stand.



4. If desired, the PipeFab™ feeder and cable management brackets can be hard mounted to the wire reel stand using the provided hardware and L brackets as shown below. This is optional as these were designed to align securely without hardware.

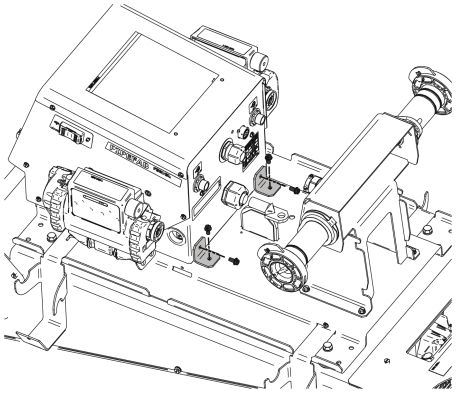


Figure 2 : L BRACKET INSTALLATION

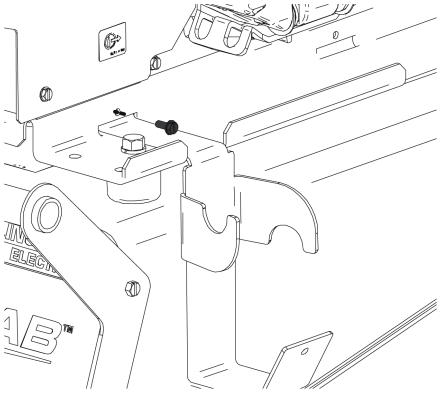
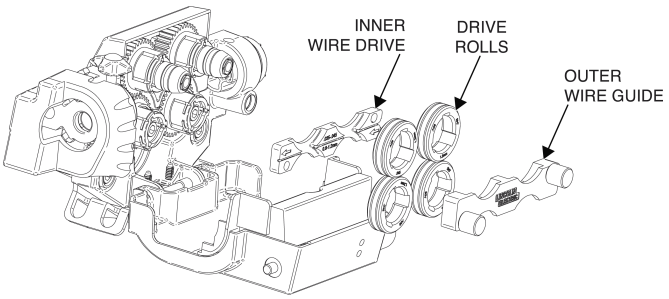


Figure 3 : CABLE MANAGEMENT BRACKET MOUNTING

INSTALLING DRIVE ROLLS

1. Turn power OFF at the welding power source.
2. Open the wire drive door by pulling on the top.
3. Remove the outer wire guide.
4. Remove drive rolls by pulling straight out. It may be necessary to wiggle the drive roll to free it from the snap ring.
5. Remove the inner wire guide.
6. Install the new inner wire guide, with the arrow pointing in the direction of wire travel.
7. Install the drive rolls and outer wire guide.
8. Close the wire drive door and adjust the pressure setting accordingly.

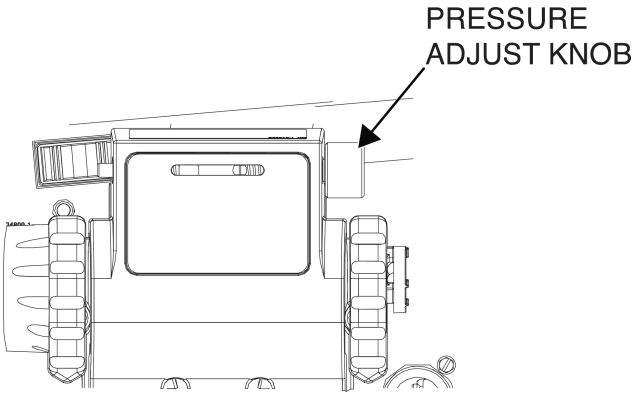


WIRE DRIVE PRESSURE SETTING

Most wires operate well with a pressure setting of “2”. The best drive roll pressure varies with wire type, wire surface, lubrication and hardness. Too much pressure may crush the wire or cause "bird-nesting", but too little pressure could cause slippage.

SETTING THE DRIVE ROLL PRESSURE

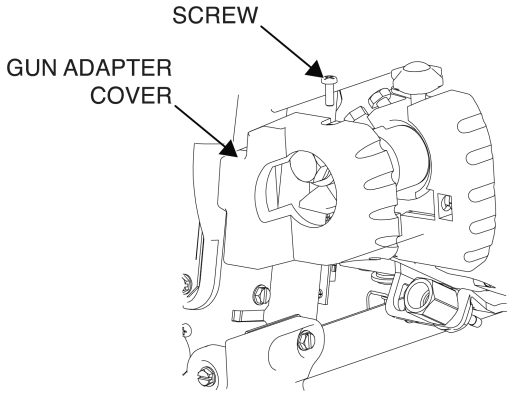
1. Press the end of the gun against a solid object that is electrically isolated from the welder output and press the gun trigger for several seconds.
2. If the wire "bird-nests" or jams, the drive roll pressure is too high. Reduce the pressure by one turn of the knob, run new wire through the gun, and repeat step 1.
3. If the only result is slippage, disconnect the gun and pull the gun cable forward about 6" (150 mm). There should be a slight waviness in the exposed wire. If there is no waviness, increase the pressure setting one turn, reconnect the gun and repeat the above steps.



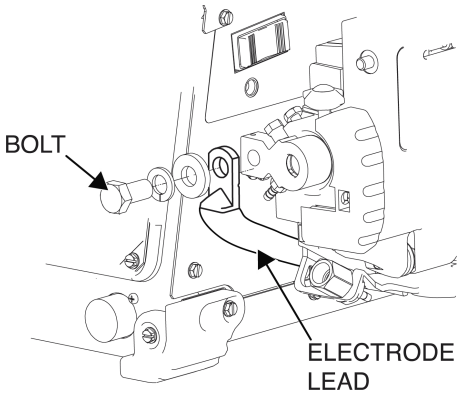
LINCOLN, STANDARD #2 - #4, STANDARD #5, MILLER GUN ADAPTER INSTALLATION

1. Turn power OFF at the welding power source.

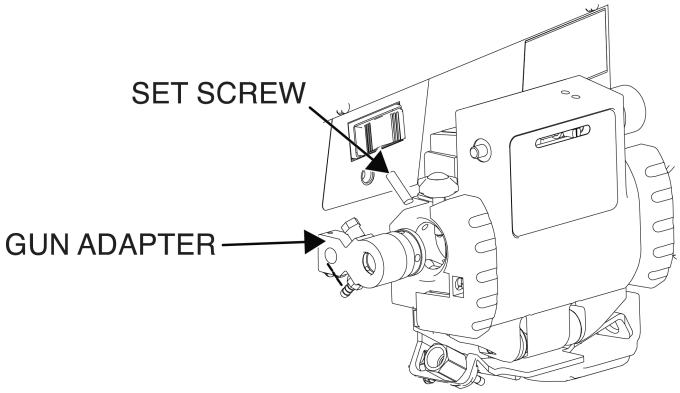
2. Using a Phillips screwdriver, remove the screw, lock washer and washer securing the gun adapter cover. Remove the gun adapter cover.



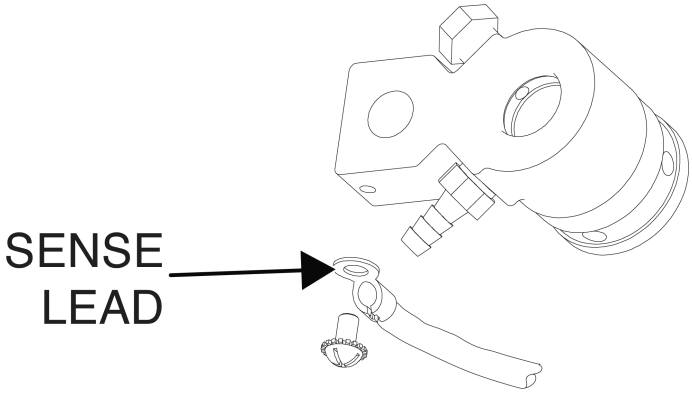
3. Using a 3/4" wrench, remove the bolt securing the electrode lead to the gun adapter.



4. Use a 1/8" hex key, loosen the set screw securing the gun adapter.

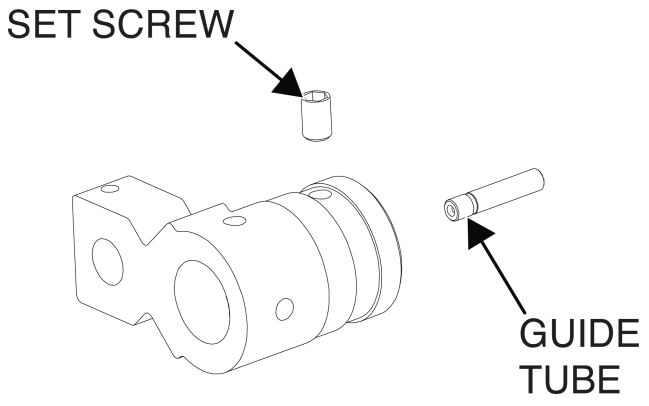


5. Using a Phillips screwdriver, remove the sense lead.



6. If a gas hose is attached to the gun adapter, use pliers to remove the hose clamp and remove the gas hose.

7. If the gun adapter requires guide tubes, install the correct size guide tube and secure with the set screw.



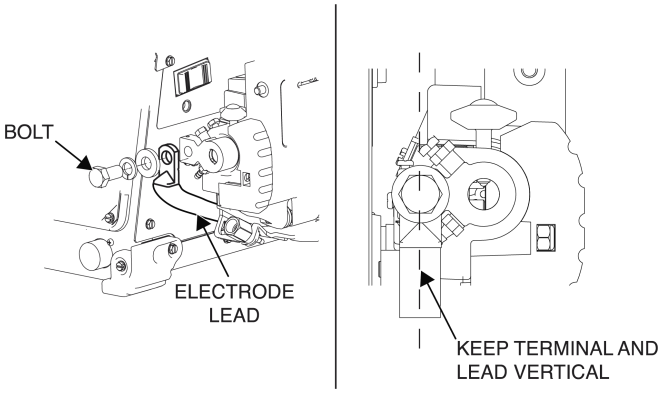
WIRE SIZE	NUMBER OF GROOVES IN GUIDE TUBE
.023 - .045" (0.6 - 1.2 mm)	1
.045 - 1/16" (1.2 - 1.6 mm)	2
1/16 - 5/64" (1.6 - 2.0 mm)	3
.068 - 7/64" (2.0 - 2.8 mm)	4

8. Assemble the sense lead to the new gun adapter. Orient the lead towards the rear of the gun adapter.

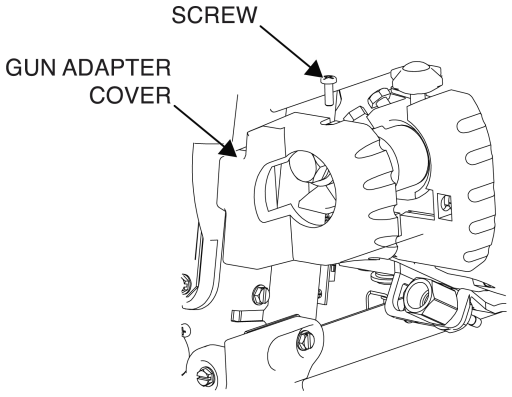
9. If required, assemble the gas hose to the gun adapter or the fitting on the feed plate and secure with a hose clamp.

10. Assemble the gun adapter to the wire drive. Tighten the set screw once the gun adapter is at a 90° angle.

11. Bolt the electrode lead to the gun adapter, making sure to route the lead straight down.



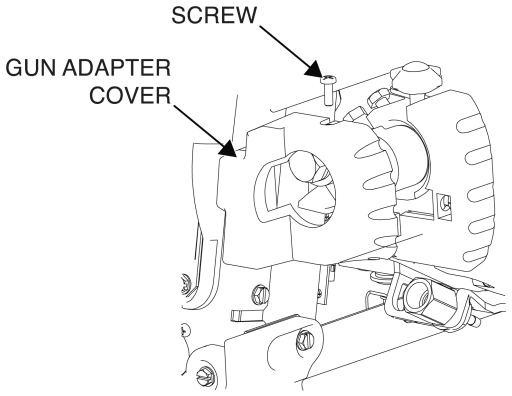
12. Assemble the gun adapter cover and secure with the screw, lock washer and washer.



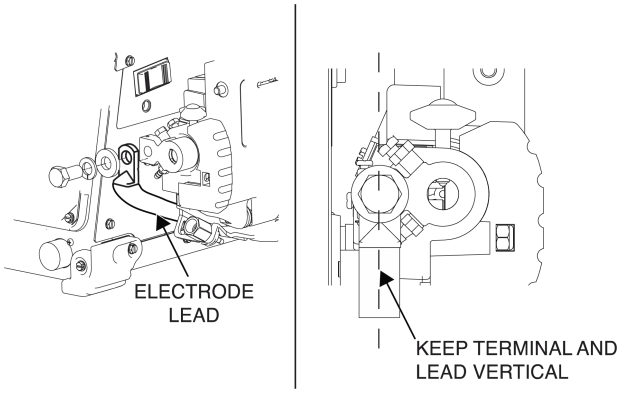
OXO AND FAST MATE GUN ADAPTER INSTALLATION

Using the Oxo or FastMate gun adapters requires a K3344-1 Standard #4 gun adapter to be installed in the wire drive.

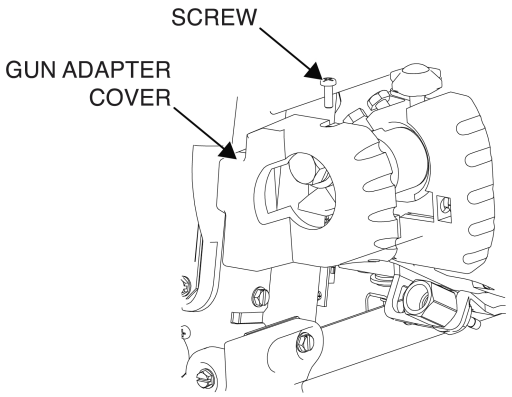
1. Turn power OFF at the welding power source.
2. Using a Phillips screwdriver, loosen the screw securing the gun adapter cover. Remove the gun adapter cover.



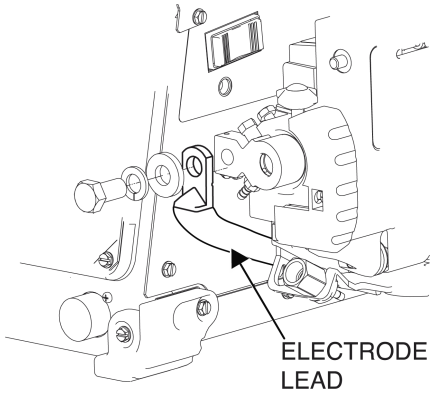
3. Using a 3/4" wrench, remove the bolt securing the electrode lead to the gun adapter.
4. Using pliers, remove the hose clamp and hose from the gun adapter.
5. Bolt the electrode lead to the gun adapter, making sure to route the lead straight down.



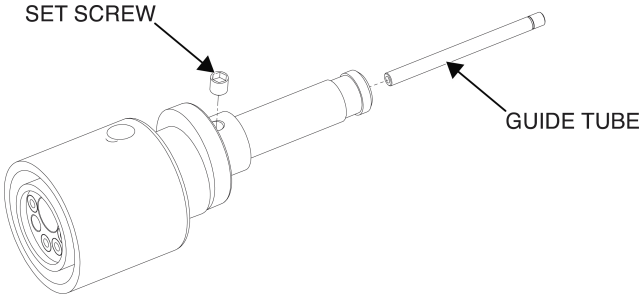
6. Assemble the gun adapter cover and secure with the screw.



7. Assemble the gas hose to the Oxo or FastMate gun adapter.



8. Select the appropriate guide tube and secure with the set screw.



WIRE SIZE	NUMBER OF GROOVES IN GUIDE TUBE
.023 - .045" (0.6 - 1.2 mm)	1
.045 - 1/16" (1.2 - 1.6 mm)	2
1/16 - 5/64" (1.6 - 2.0 mm)	3
.068 - 7/64" (2.0 - 2.8 mm)	4

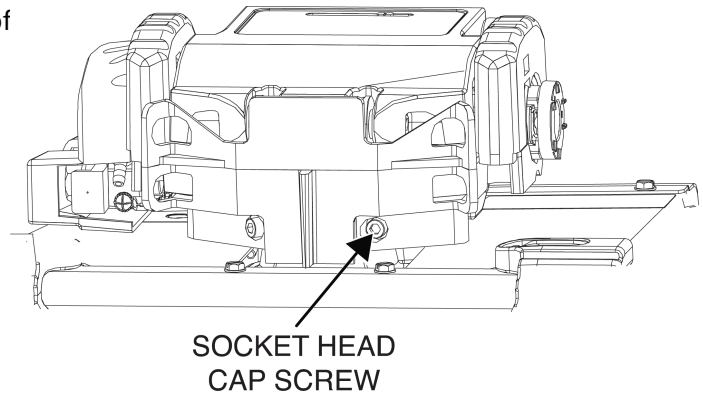
9. Slide the Oxo or FastMate gun adapter into the wire drive and secure with the thumb screw.

10. For FastMate gun adapters, connect the trigger pigtail to the connector on the front of the feeder.

ROTATING THE WIRE DRIVE

1. Turn power OFF at the welding power source.

2. Locate the socket head cap screw at the bottom of the wire drive. Loosen, but do not remove the screw.



3. Rotate the wire drive to the desired position and tighten the screw.

SHIELDING GAS CONNECTION

⚠ WARNING



CYLINDER may explode if damaged.

Keep cylinder upright and chained to support.

Keep cylinder away from areas where it may be damaged.

Never lift welder with cylinder attached.

Never allow welding electrode to touch cylinder.

Keep cylinder away from welding or other live electrical circuits.

⚠ WARNING



BUILD-UP OF SHIELDING GAS may harm health or kill.

Shut off shielding gas supply when not in use.

SEE AMERICAN NATIONAL STANDARD Z-49.1, "SAFETY IN WELDING AND CUTTING" PUBLISHED BY THE AMERICAN WELDING SOCIETY.

Maximum inlet pressure is 100 psi. (6.9 bar.)
The inlet fitting is 5/8 - 18 CGA type connection.
Install the shielding gas supply as follows:

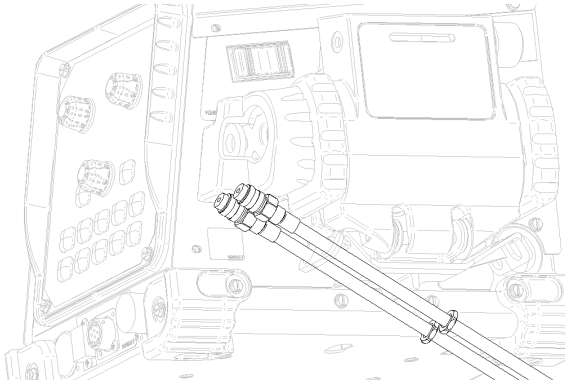
1. Secure the cylinder to prevent it from falling.
2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth. **DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT!** Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt, which may have accumulated in the valve outlet.
4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench.

   Note: If connecting to 100% CO_2 cylinder, insert regulator adapter between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO_2 cylinder.
5. Attach one end of the inlet hose to the outlet fitting of the flow regulator. Attach the other end to the welding system shielding gas inlet. Using a wrench, tighten the union nuts.
6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.
7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gage stops moving, open the valve fully.
8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making a weld.

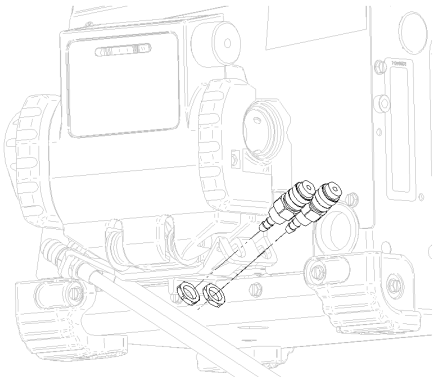
WATER-COOLED GUN CONNECTIONS

The K590-6 water connection kit installs underneath the wire drive.

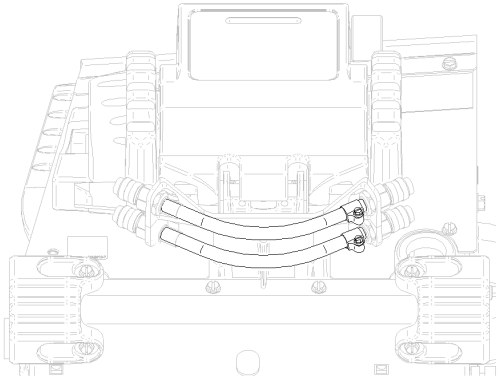
1. Turn power OFF at the welding power source.
2. Assemble two of the Female Quick Disconnect fittings with hoses, feed these two lines through the front holes in the bracket, underneath the wire drive assembly.
3. Install two nuts to fittings, using a 17mm Wrench (2 places as shown). Torque to 7-10 ft-lbs (9-13 N-m)

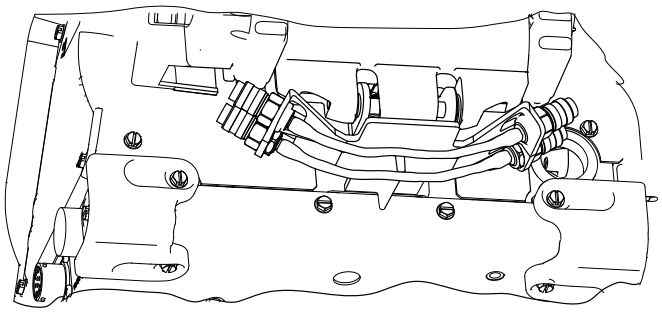


4. Cut the two water hoses to appropriate length, slide the two Hose Clamps and two 17mm nuts over the two hose ends and assemble hoses to the Quick Disconnect Fittings, make sure to push hoses fully onto the barbed fitting.



5. Install two nuts to fittings, using a 17mm Wrench (2 places as shown). Torque to 7-10 ft-lbs (9-13 N-m)
6. Secure the Hose Clamps positioned 1/8” from end of hose using a 1/4" nut driver (2 places as shown). Torque to 30-45 in-lbs (3.4-5.1 N-m).





LOADING SPOOLS AND COILS

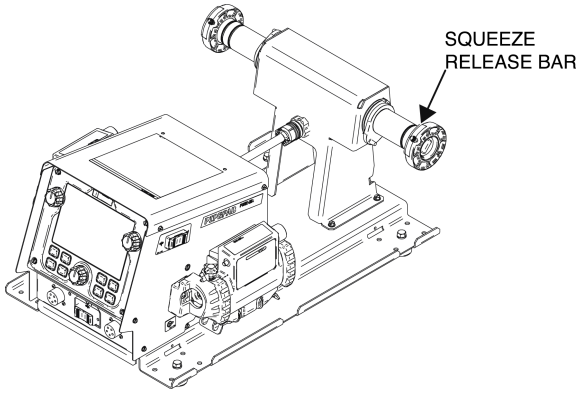
⚠ WARNING

Keep hands, hair, clothing and tools away from rotating equipment.

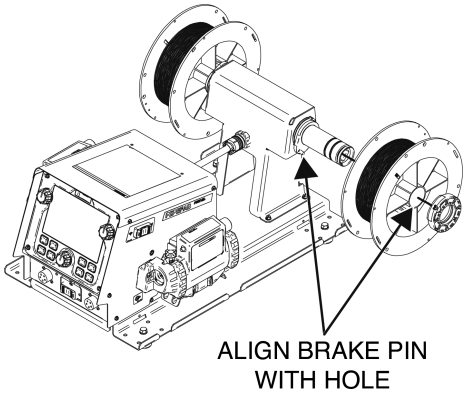
Do not wear gloves when threading wire or changing wire spool.

Only qualified personnel should install, use or service this equipment.

1. Turn power OFF at the welding power source.
2. Squeeze the release bar on the retaining collar and remove it from the spindle.



3. Place the spool on the spindle, aligning the spindle brake pin with one of the holes in the back side of the spool. Be certain the wire feeds off of the spool in the proper direction.



4. Re-install the retaining collar, with the metal bar engaging one of the grooves of the spindle. The release bar will spring out when engaged.

ELECTRICAL INSTALLATION

INPUT AND GROUND CONNECTION

Only a qualified electrician should connect the PipeFab™. Installation should be made in accordance with the appropriate National Electrical Code, all local codes and the information in this manual.

⚠ WARNING



FALLING EQUIPMENT can cause injury.

Lift only with equipment of adequate lifting capacity.

Be sure machine is stable when lifting.

Do not operate machine while suspended when lifting.

MACHINE GROUNDING

The frame of the welder must be grounded. A ground terminal marked with a ground symbol is located next to the input power connection block.



See your local and national electrical codes for proper grounding methods.

HIGH FREQUENCY PROTECTION

Locate the PipeFab™ away from radio-controlled machinery. The normal operation of the PipeFab™ may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.

INPUT CONNECTION

Use a three-phrase supply line. A 1.40 inch diameter access hole with strain relief is located on the case back. Route input power cable through this hole and connect L1, L2, L3, and ground per connection diagrams and National Electric Code. To access the input power connection block, remove the left door of the machine (four screws). Be sure to reinstall the door before operation.

ALWAYS CONNECT THE POWER WAVE GROUNDING LUG (LOCATED AS SHOWN IN Figure 5 : K3731-1 INPUT POWER CONNECTION on page A-16 AND Figure 6 : K3732-1 INPUT POWER CONNECTION on page A-16) TO A PROPER SAFETY (EARTH) GROUND.

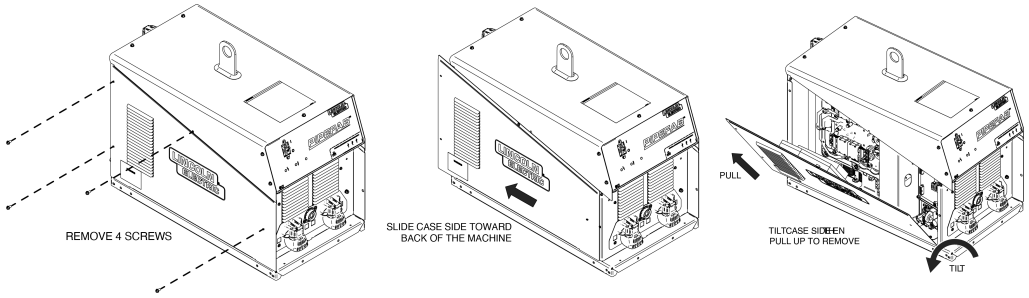


Figure 4 : CASE SIDE REMOVAL

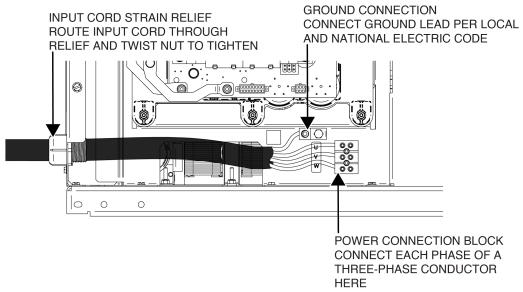


Figure 5 : K3731-1 INPUT POWER CONNECTION

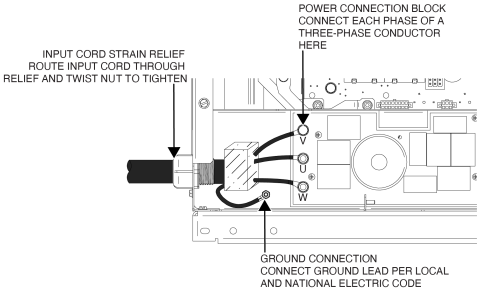


Figure 6 : K3732-1 INPUT POWER CONNECTION

INPUT FUSE AND SUPPLY WIRE CONSIDERATIONS

Refer to Technical Specification Section for recommended fuse, wire sizes and type of the copper wires. Fuse the input circuit with the recommended super lag fuse or delay type breakers (also called "inverse time" or "thermal / magnetic" circuit breakers). Choose input and grounding wire size according to local or national electrical codes. Using input wire sizes, fuses or circuit breakers smaller than recommended may result in "nuisance" shut-offs from welder inrush currents, even if the machine is not being used at high currents.

INPUT VOLTAGE SELECTION

The PipeFab™ automatically adjusts to work with different input voltages. No reconnect switch settings are required.

⚠ WARNING

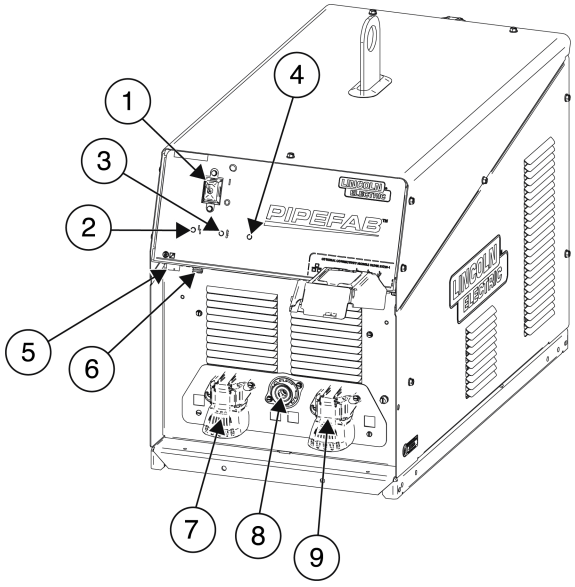


The PipeFab™ ON / OFF switch is not intended as a service disconnect for this equipment. Only a qualified electrician should connect the input leads to the PipeFab™. Connections should be made in accordance with all local and national electrical codes and the connection diagram located on the inside of the reconnect access door of the machine. Failure to do so may result in bodily injury or death.

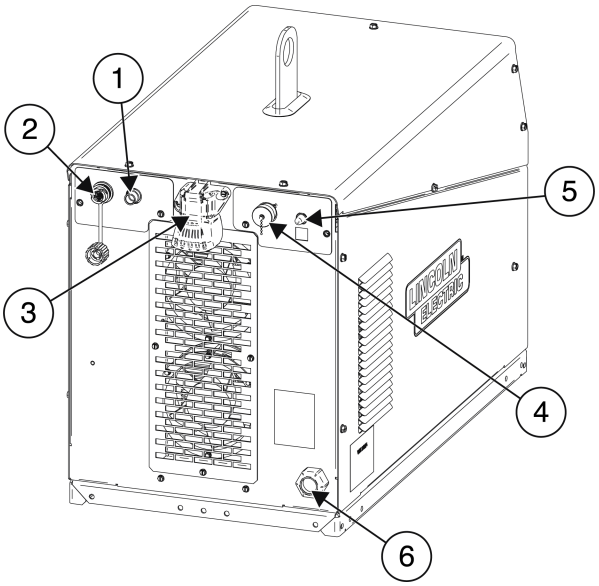
PipeFab™ POWER SOURCE CONNECTOR LOCATIONS

CASE FRONT LOCATIONS

1. **Power Switch**
2. **Status LED**
3. **Thermal LED**
4. **Status II LED**
5. **12 Pin Connector**
6. **Sense Lead Connector**
7. **Work Weld Output Terminal**
8. **TIG Weld Output Terminal**
9. **Stick Weld Output Terminal**

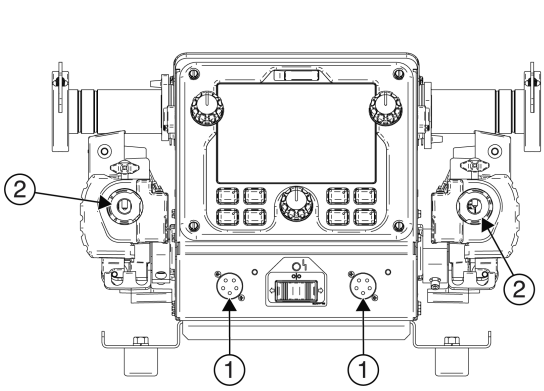


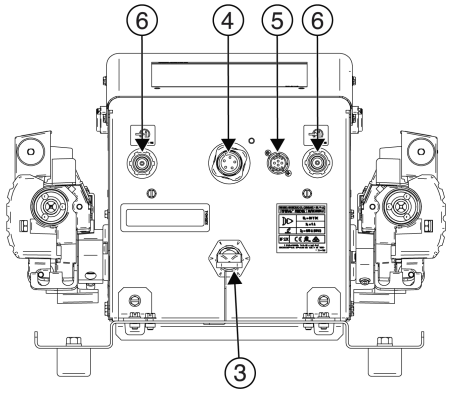
CASE BACK LOCATIONS



1. **TIG Gas Input Solenoid**
2. **Ethernet**
3. **MIG Weld Output Stud**
4. **ArcLink Connector**
5. **40 Volt Circuit Breaker**
6. **Input Power Cord**

PipeFab™ FEEDER CONNECTOR LOCATIONS

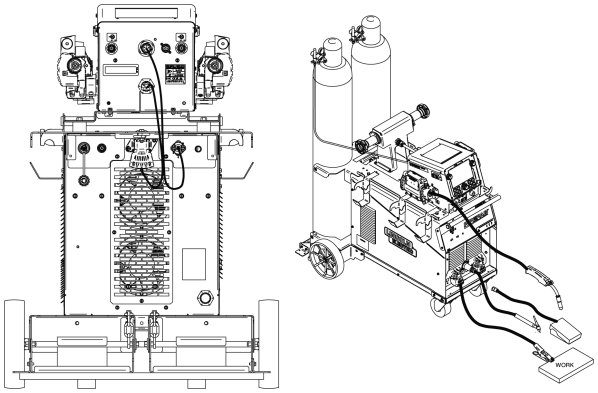




1. **5 Pin Trigger Connector**
2. **Gun Adapter**
3. **Input Weld Cable**
4. **5 Pin ArcLink Cable**
5. **12 Pin Remote UI Connector**
6. **MIG Input Gas Solenoid**

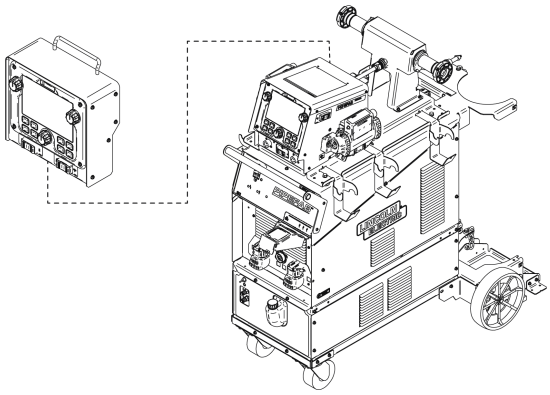
CONNECTION DIAGRAM

The PipeFab™ system was design such that all connections can be maintained when switching welding processes. There is no longer the need to changeover torches and welding cables between processes. The PipeFab™ Power Source will automatically change polarity and active output terminals based on the selected process. This selection is made on the user interface of the PipeFab™ Feeder.



REMOTE USER INTERFACE CONFIGURATION

A remote user interface (UI) can be added by simply plugging the PipeFab™ Remote UI into the PipeFab™ Feeder, 12 pin located on the back of the feeder. The remote UI is designed for hard automation setups with a manipulator.



The Remote UI is to be connected to the system in addition to the UI mounted in the Wire Feeder. When a remote UI is connected, only one UI will be active at a time. In order to activate an inactive UI, press any button.

REMOTE TRIGGER SWITCH

A remote trigger switch is available for use in hard automation setups with or without a Remote UI. This is a toggle switch and lead assembly which connects to the appropriate gun trigger connection to start and stop the wire feeder. Turn the switch ON to start welding at the set parameters. Turn the switch OFF to stop welding.

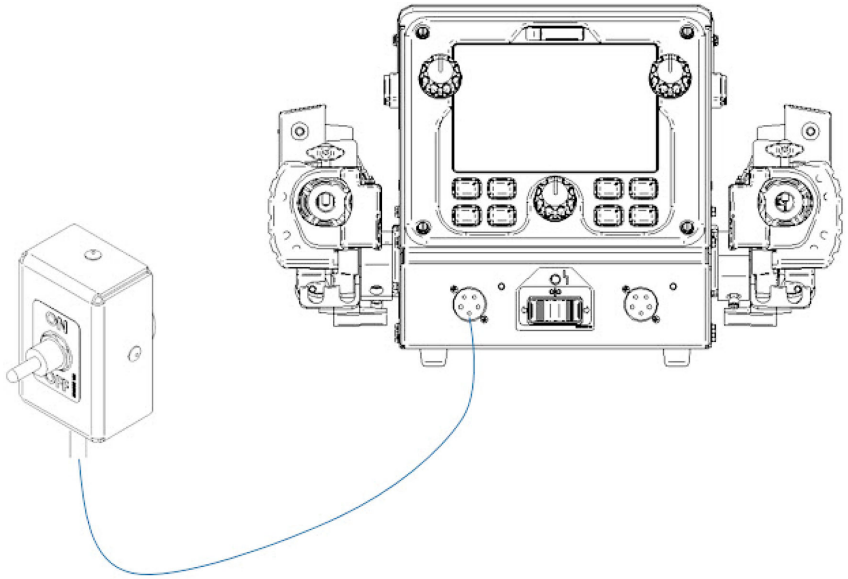


Figure 7 : CONNECTION DIAGRAM OF REMOTE TRIGGER

RECOMMENDED WORK CABLE SIZES FOR ARC WELDING

GENERAL GUIDELINES

- **Select the appropriate size cables per the "Output Cable Guidelines" below.** Excessive voltage drops caused by undersized welding cables and poor connections often result in unsatisfactory welding performance. Always use the largest welding cables (electrode and work) that are practical, and be sure all connections are clean and tight.

  Note: Excessive heat in the weld circuit indicates undersized cables and / or bad connections.
- **Route all cables directly to the work and wire feeder, avoid excessive lengths and do not coil excess cable.** Route the electrode and work cables in close proximity to one another to minimize the loop area and therefore the inductance of the weld circuit.
- **Always weld in a direction away from the work (ground) connection.**

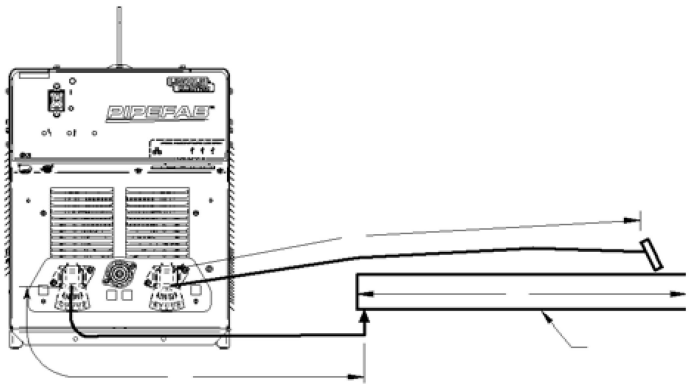
Table below shows copper cable sizes recommended for different currents and duty cycles. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing cable drop.

Table 10 :RECOMMENDED CABLE SIZES - RUBBER COVERED COPPER - RATED 167° F (75° C) [1]

AMPERES	PERCENT DUTY CYCLE	CABLE SIZES FOR COMBINED LENGTHS OF ELECTRODE AND WORK CABLES				
		0 TO 50 FT.	50 TO 100 FT.	100 TO 150 FT.	150 TO 200 FT.	200 TO 250 FT.
200	100	2	2	2	1	1/0
250	100	1	1	1	1	1/0
300	100	2/0	2/0	2/0	2/0	3/0
400	100	3/0	3/0	3/0	3/0	4/0
450	100	3/0	3/0	4/0	4/0	2 - 3/0
500	60	2/0	2/0	3/0	3/0	4/0
550	40	2/0	2/0	3/0	3/0	4/0

CABLE INDUCTANCE AND ITS EFFECTS ON WELDING

Excessive cable inductance will cause the welding performance to degrade. There are several factors that contribute to the overall inductance of the cabling system including cable size, and loop area. The loop area is defined by the separation distance between the electrode and work cables, and the overall welding loop length. The welding loop length is defined as the total of length of the electrode cable (A) + work cable (B) + work path (C).



To minimize inductance always use the appropriate size cables, and whenever possible, run the electrode and work cables in close proximity to one another to minimize the loop area. Since the most significant factor in cable inductance is the welding loop length, avoid excessive lengths and do not coil excess cable. For long work piece lengths, a sliding ground should be considered to keep the total welding loop length as short as possible.

REMOTE SENSE LEAD SPECIFICATIONS

VOLTAGE SENSING OVERVIEW

The best arc performance occurs when the PipeFab™ has accurate data about the arc conditions.

Depending upon the process, inductance within the electrode and work cables can influence the voltage apparent at the studs of the welder, and have a dramatic effect on performance. Remote voltage sense leads are used to improve the accuracy of the arc voltage information supplied to the control pc board. Sense Lead Kits (K940-xx) are available for this purpose.

The PipeFab™ has the ability to automatically sense when remote sense leads are connected. With this feature there are no requirements for setting-up the machine to use remote sense leads. This feature can be disabled through the Weld Manager Utility (available at www.powerwavesoftware.com) or through the set-up menu on the PipeFab™ feeder.

⚠ CAUTION

If the auto sense lead feature is disabled and remote voltage sensing is enabled, but the sense leads are missing or improperly connected extremely high welding outputs may occur.

GENERAL GUIDELINES FOR VOLTAGE SENSE LEADS

Sense leads should be attached as close to the weld as practical, and out of the weld current path when possible. In extremely sensitive applications it may be necessary to route cables that contain the sense leads away from the electrode and work welding cables.

Voltage sense leads requirements are based on the weld process (See Table Below).

PROCESS	ELECTRODE VOLTAGE SENSING (1) 67 LEAD	WORK VOLTAGE SENSING (2) 21 LEAD
GMAW	67 LEAD REQUIRED	21 LEAD OPTIONAL (3)
GMAW-P	67 LEAD REQUIRED	21 LEAD OPTIONAL (3)
FCAW	67 LEAD REQUIRED	21 LEAD OPTIONAL (3)
STT (1)	67 LEAD REQUIRED	21 LEAD OPTIONAL (3) RECOMMENDED FOR CABLES LONGER THAN 75 FT.
GTAW	VOLTAGE SENSE AT STUDS	VOLTAGE SENSE AT STUDS
SMAW	VOLTAGE SENSE AT STUDS	VOLTAGE SENSE AT STUDS

(1) The electrode voltage sense lead (67) is automatically enabled by the weld process, and integral to the 5 pin ArcLink control cable (K1543-xx).

(2) When a work voltage sense lead (21) is connected the power source will automatically switch over to using this feedback (if the auto sense feature is enabled).

(3) Negative polarity semi-automatic process operation WITHOUT use of a remote work sense lead (21) requires the Negative Electrode Polarity attribute to be set.

ELECTRODE VOLTAGE SENSING

The remote ELECTRODE sense lead (67) is built into the 5 pin ArcLink control cable and is always connected to the wire drive feed plate when a wire feeder is present. Enabling or disabling electrode voltage sensing is application specific, and automatically configured by the active weld mode.

⚠ CAUTION

If the auto sense lead feature is disabled and the weld polarity attribute is improperly configured extremely high welding outputs may occur.

WORK VOLTAGE SENSING

While most applications perform adequately by sensing the work voltage directly at the output stud, the use of a remote work voltage sense lead is recommended for optimal performance. The remote WORK sense lead (21) can be accessed through the four pin voltage sense connector located on the control panel by using the K940 Sense Lead Kit. It must be attached to the work as close to the weld as practical, but out of the weld current path. For more information regarding the placement of remote work voltage sense leads, see in this section entitled "Voltage Sensing Considerations for Multiple Arc Systems."

NEGATIVE ELECTRODE POLARITY

The PipeFab™ has the ability to automatically change the polarity of the power source. With this feature there are no setup requirements for welding with negative electrode polarity. Negative polarity is only available for TIG welding.

VOLTAGE SENSING CONSIDERATIONS FOR MULTIPLE ARC SYSTEMS

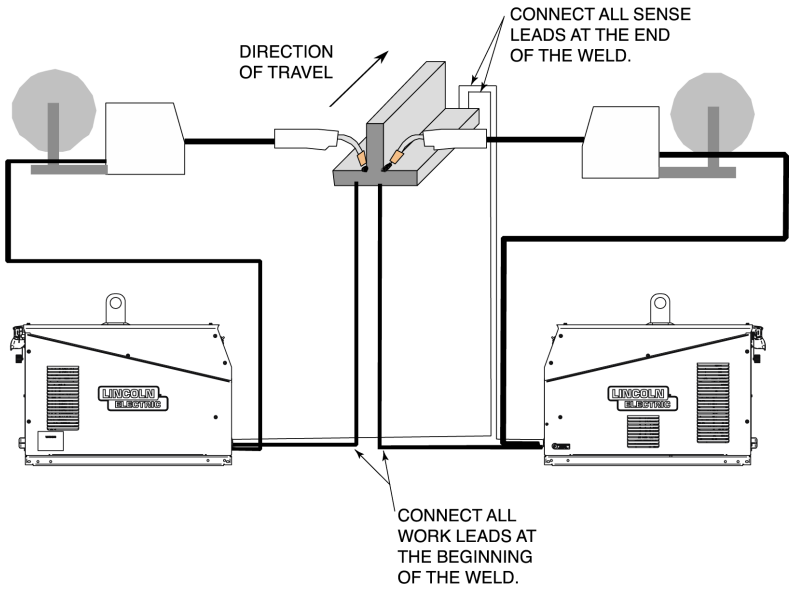
Special care must be taken when more than one arc is welding simultaneously on a single part. Multiple arc applications do not necessarily dictate the use of remote work voltage sense leads, but they are strongly recommended.

If Sense Leads ARE NOT Used:

- Avoid common current paths. Current from adjacent arcs can induce voltage into each-others current paths that can be misinterpreted by the power sources, and result in arc interference.

If Sense Leads ARE Used:

- Position the sense leads out of the path of the weld current. Especially any current paths common to adjacent arcs. Current from adjacent arcs can induce voltage into each-others current paths that can be misinterpreted by the power sources, and result in arc interference.
- **For longitudinal applications**, connect all work leads at one end of the WeldMent, and all of the work voltage sense leads at the opposite end of the WeldMent. Perform welding in the direction away from the work leads and toward the sense leads.
- **For circumferential applications**, connect all work leads on one side of the weld joint, and all of the work voltage sense leads on the opposite side, such that they are out of the current path.



CONTROL CABLE CONNECTIONS

ArcLink Control Cables are available in two forms:

- K1543-xx series for most indoor or factory installations.
- K2683-xx series when the equipment is frequently moved.

ArcLink / LincNet control cables are special high quality cables for digital communication. The cables are copper 5 conductor cable in a SO-type rubber jacket. There is one 20 gauge twisted pair for network communications. This pair has an impedance of approximately 120 ohms and a propagation delay per foot of less than 2.1 nanoseconds. There are two 12 gauge conductors that are used to supply 40 VDC to the network. The fifth wire is 18 gauge and is used as an electrode sense lead.

GENERAL GUIDELINES

Genuine Lincoln control cables should be used at all times (except where noted otherwise). Lincoln Cables are specifically designed for the communication and power needs of the Power Wave® / Power Feed™ systems. Most are designed to be connected end to end for ease of extension. Generally, it is recommended that the total length not exceed 200 ft. (61 m). The use of nonstandard cables, especially in lengths greater than 25 feet, can lead to communication problems (system shutdowns), poor motor acceleration (poor arc starting), and low wire driving force (wire feeding problems). Always use the shortest length of control cable possible, and DO NOT coil excess cable.

Regarding cable placement, the best results will be obtained when control cables are routed separate from the weld cables. This minimizes the possibility of interference between the high currents flowing through the weld cables, and the low level signals in the control cables. These recommendations apply to all communication cables including ArcLink and Ethernet connections.



POWER SOURCE	
PIN	**FUNCTION**
A	ARCLINK
B	ARCLINK
C	67 VOLTAGE SENSE
D	40 VDC
E	COMMON

WIRE FEEDER	
PIN	**FUNCTION**
A	ARCLINK
B	ARCLINK
C	67 VOLTAGE SENSE
D	40 VDC
E	COMMON

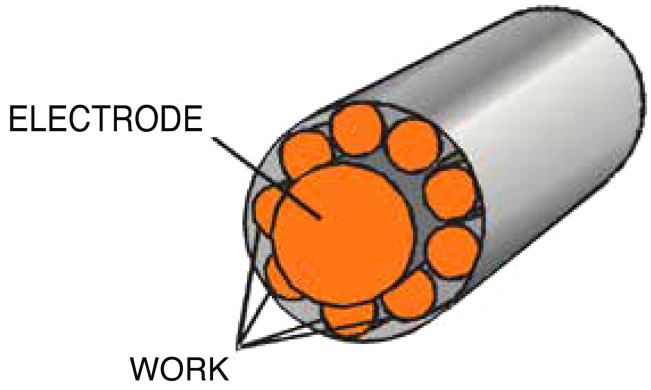
CONNECTION BETWEEN POWER SOURCE AND ETHERNET NETWORKS

The PipeFab™ is equipped with a ODVA compliant RJ-45 Ethernet connector, which is located on the front panel. It is critical that all Ethernet cables external to either a conduit or an enclosure are solid conductor, shielded cat 5e cable, with a drain. The drain should be grounded at the source of transmission. For best results, route Ethernet cables away from weld cables, wire drive control cables, or any other current carrying device that can create a fluctuating magnetic field. For additional guidelines refer to ISO / IEC 11801. Failure to follow these recommendations can result in an Ethernet connection failure during welding.

USB PORTS

When equipped with the Optional Connectivity module K4720-1; the PipeFab™ will be able to connect remotely (wireless) via a USB WI-FI adapter (customer must supply) or wired through an Ethernet cable.

WELD CABLES, COAXIAL



Coaxial welding cables are specially designed welding cables for STT™ and pulse welding. Coaxial weld cables feature low inductance, allowing fast changes in the weld current. Regular cables have a higher inductance which may distort the STT™ wave shape. Inductance becomes more severe as the weld cables become longer.

Coaxial cables work best for high performance waveforms and when:

- long cables are present.
- the cables are housed in a metal tray.

A coaxial weld cable is constructed with multiple small leads wrapped around one large lead. The large inner lead connects to the electrode stud on the power source and the electrode connection on the wire feeder. The small leads combine together to form the work lead, one end attached to the power source and the other end to the work piece.

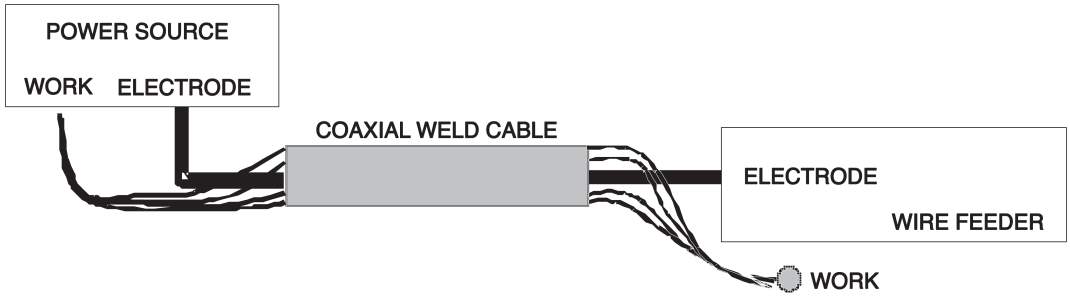
To install:

1. Turn the input power off at the welding power source.
2. Connect one end of the center lead to the power source electrode connection, and the other end to the wire feeder electrode connection.
3. Connect the outer lead bundle to the power source work connection, and the other end to the work piece. Minimize the length of any work lead extension for best results.
4. Insulate all connections.

Table 11 :RECOMMENDED CABLE SIZES (RUBBER COVERED COPPER - RATED 75° C) **

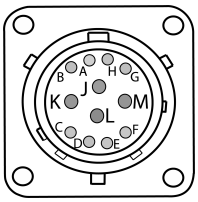
AMPERES	DUTY CYCLE	COAXIAL CABLE LENGTH			
		0 TO 25 FT.	25 TO 50 FT.	50 TO 75 FT.	75 TO 100 FT.
250	100%	1	1	1	1
300	60%	1	1	1	1/0
350	60%	1/0	1/0	--	--

** Tabled values are for operation at ambient temperatures of 40° C and below. Applications above 40° C may require cables larger than recommended or cables rated higher than 75° C.

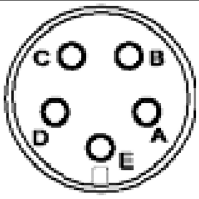


FEEDER CONNECTORS

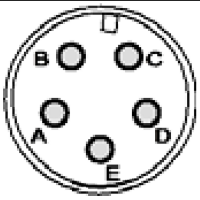
ADVANCED ACCESSORIES CONNECTOR (12 PIN)
Table 12 :

PICTURE	FUNCTION	PIN	WIRING
	12 PIN CONNECTOR FOR PipeFab™ REMOTE UI.	A	CAN LOW
		B	CAN HIGH
		C	NOT USED
		D	NOT USED
		E	NOT USED
		F	NOT USED
		G	NOT USED
		H	NOT USED
		J	40 VDC COMMON
		K	40 VDC +
		L	NOT USED
		M	NOT USED

TRIGGER CONNECTOR (5 PIN)
Table 13 :

PICTURE	FUNCTION	PIN	WIRING
	5 PIN TRIGGER CONNECTOR FOR PUSH-ONLY GUNS.	A	TRIGGER
		B	NOT USED
		C	TRIGGER
		D	N/A
		E	N/A

ARCLINK CONNECTOR (5 PIN)
Table 14 :

PICTURE	FUNCTION	PIN	WIRING
	5 PIN CONNECTOR FOR COMMUNICATION AND POWER.	A	CAN
		B	CAN
		C	67 ELECTRODE VOLTAGE SENSE
		D	40 VDC
		E	COMMON

OPERATION

SAFETY PRECAUTIONS

READ AND UNDERSTAND ENTIRE SECTION BEFORE OPERATING MACHINE.

⚠ WARNING



ELECTRIC SHOCK CAN KILL.

Do not touch electrically live part or electrode with skin or wet clothing.

Insulate yourself from work and ground.

Always wear dry insulating gloves.

Do not operate with covers, panels or guards removed or open.

⚠ WARNING



FUMES AND GASES can be dangerous.

Keep your head out of fumes.

Use ventilation or exhaust to remove fumes from breathing zone.

⚠ WARNING



WELDING SPARKS can cause fire or explosion.

Keep flammable material away.

⚠ WARNING



ARC RAYS can burn.

Wear eye, ear and body protection.

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

	WARNING OR CAUTION		WELDING AMPERAGE		THERMAL
	INPUT POWER		WELDING VOLTAGE		SHIELDING GAS
	ON		WIRE FEED SPEED		ARC START PARAMETERS
	OFF		TRIM		ARC END PARAMETERS
	POSITIVE OUTPUT		WORK		DANGEROUS VOLTAGE
	NEGATIVE OUTPUT		COLD FEED		COOLER
	FRAME GROUND		GAS PURGE		STATUS
	INPUT VOLTAGE		SHIELDING GAS INLET		OUTPUT
	INPUT CURRENT		SHIELDING GAS OUTLET		PROTECTIVE GROUND
	OUTPUT CURRENT		4-STEP TRIGGER		OPERATORS MANUAL
	CIRCUIT BREAKER		CV PROCESS		TIG PROCESS
	STICK PROCESS				

DEFINITIONS

BASIC DEFINITIONS

Arc Force - Arc Force adjusts the short circuit current for a soft arc, or for a forceful, driving arc. It helps to prevent sticking and shorting of organic coated electrodes, particularity globular transfer types such as stainless and low hydrogen. Arc Force is especially effective for root pass on pipe with stainless electrode and helps to minimize spatter for certain electrodes and procedures. Only displayed when set to a non-zero value.

Burn back Time - Adjustable time delay between turning off the wire feed and turning off the arc. Burn back helps to prevent wire sticking to the puddle. The burn back feature will allow current to flow for a specified time period at the end of a weld after wire feeding has stopped.

Cold Feed - Method for feeding wire without the contactor or gas valve being energized.

Crater Time - Controls the WFS and voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.

FCAW - Weld process that uses gas shielded wire.

Gas Purge - Turns on the gas solenoid for as long as the gas purge switch is held.

Gas Type - Shielding gases that can be used: Argon, CO_2, 98 Ar / 2 CO_2, 90 Ar / 10 CO_2, 85 Ar / 15 CO_2, 80 Ar / 20 CO_2, 75 Ar / 25 CO_2.

HF - TIG starting method. HF turns on to help start the arc when output is enabled. HF start is used when a non-contact arc start method is required.

Hot Start - Increases output current during the start of welding, helps ignite the arc quickly and reliably. Only displayed when set to a non-zero value.

MIG - Weld process that has three different modes: CV, STT, and Pulse.

Pinch - Controls the arc characteristics when short-arc welding.

Post-flow - Time that the shielding gas continues to flow after the arc has been terminated. Only displayed when set to a non-zero value.

Pre-flow Time - Adjusts the time that shielding gas flows before the welding output turns on.

Process - Selection of MIG, FCAW, TIG, or Stick.

Run-In - Allows adjusting the wire feed speed prior to the arc being established. A low run-in speed permits smooth arc starts. After the arc is established the run-in value is inactive and the set wire feed speed is present. The run-in option is available in MIG and FCAW modes.

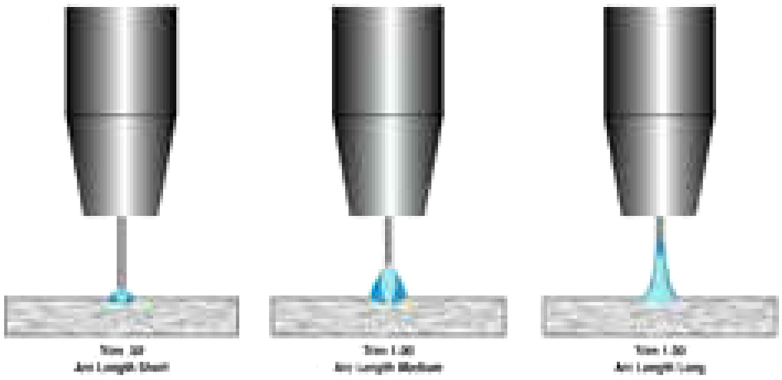
Start Time - Controls the WFS and voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.

Stick - SMAW weld process, uses either a soft 7018 or crisp 6010 electrode.

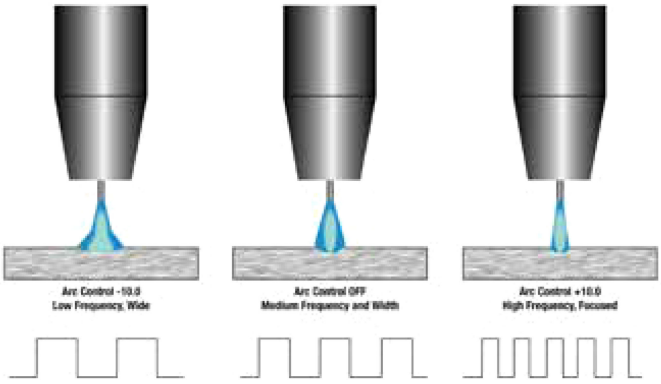
Synergic - Use of pre-programmed parameters to determine the needed settings at a specific wire feed speed.

TIG - GTAW weld process, uses either HF or Touch Start weld mode to begin welding.

Trim - Adjusts the arc length.



Ultimarc - Ultimarc regulate the focus or shape of the arc. Values greater than 0.0 increase the pulse frequency while decreasing the background current, resulting in a tight, stiff arc best for high speed sheet metal welding. Values less than 0.0 decrease the pulse frequency while increasing the background current, for a soft arc good for out-of-position welding. The MIG mode will determine if Ultimarc is used.



Wire Diameter - Selection of wire size for MIG and FCAW processes.
Wire Type - Selection of wire materials for MIG processes.

PRODUCT DESCRIPTION

The PipeFab™ welding system consists of a portable advanced-process power source and feeder designed from the ground up to be the ideal system for welding steel, stainless, and nickel pipe. The PipeFab™ is ideal for applications where critical root, fill, and cap welds are needed to be performed at the highest level of quality. The new state of the art PipeFab™ Feeder features a robust 7" LCD display which offers a bright and easy to use interface to control all processes. With GMAW, GMAW-STT, GMAW-P, FCAW, GTAW (DC) and SMAW functionality, the dedicated process buttons and individual process memories make switching from one process to another simple and intuitive.

Superior arc performance, simplicity, and flexibility are at the core of the PipeFab™. Being an advanced software controlled system, the PipeFab™ is readily user updatable with free software from www.powerwavesoftware.com allowing it to take advantage of the latest and greatest innovations from Lincoln Electric's welding technologies.

PRODUCT LISTING

K NUMBER	PRODUCT NAME
K3731-1	PipeFab™ CSA
K3732-1	PipeFab™ CE
K3734-1	PipeFab™ READY PAK (INCLUDES POWER SOURCE K3731-1, FEEDER K3735-1, AND UNDERCARRIAGE K3736-1)
K3735-1	PipeFab™ FEEDER
K3738-1	PipeFab™ REMOTE UI

RECOMMENDED PROCESSES AND EQUIPMENT

RECOMMENDED PROCESSES

- GMAW, GMAW-P, GMAW-STT
- FCAW
- SMAW
- GTAW (DC)

RECOMMENDED EQUIPMENT

- The PipeFab™ Power Source and PipeFab™ Feeder make one cohesive unit that must be paired together.

PROCESS LIMITATIONS

- Processes must be within the duty cycle and rating of the power source and wire feeder. See the Technical Specifications section of this manual for more information.

EQUIPMENT LIMITATIONS

- The software based weld tables of the PipeFab™ Power Source limit the process capability within the output range and the safe limits of the machine. In general the processes will be limited to .030 - .052 solid steel wire, .030 - .045 stainless wire, .035 - 1/16 cored wire.
- The power source and UI may require software updates.
- The system does not include weld cables.
- Not compatible with K1500-1, K1500-2, K1500-3, K1500-4 K1500-5 and K489-7 gun adapter kits.
- PipeFab™ Feeder is only compatible with the PipeFab™ Power Source.
- PipeFab™ Power Source is only compatible with the PipeFab™ Feeder.

DESIGN FEATURES

POWER SOURCE

- Multiple process DC output range: 5 - 400 Amps.
- 200 - 600 VAC, 3 phase, 50 - 60 Hz input power.
- New and Improved Line Voltage Compensation holds the output constant over wide input voltage fluctuations.
- Utilizes next generation microprocessor control, based on the ArcLink platform.
- State-of-the-art power electronics technology yields superior welding capability.
- Electronic overcurrent protection.

- Input overvoltage protection.
- F.A.N. (fan as needed). Cooling fan only runs when needed.
- Thermostatically protected for safety and reliability.
- Ethernet connectivity.
- Panel mounted Status and Thermal LED indicators facilitate quick and easy troubleshooting.
- Potted PC boards for enhanced ruggedness / reliability.
- Waveform Control Technology™ for good weld appearance and low spatter.
- STT® Capable.

FEEDER

- Standard bench can be converted to boom configuration and automatic oscillators.
- The feed plates can be rotated to accommodate different gun angles.
- Uses 5 pin K1543-xx or K2683-xx ArcLink cables. Cables may be joined together to make longer lengths.
- 4 roll wire drive.
- Changeable gun adapters.
- Ball bushing inlet guide.
- High resolution encoder on the motor.
- 7" digital user interface display.
- Displays voltage / trim, wire feed speed / amps, process settings, advanced settings, and more.
- Quick select buttons for switching processes.
- Center push-to-select encoder to navigate menus on screen.
- Total of 24 memories. 4 dedicated memories per process (TIG and STICK) and 4 dedicated memories per process and side (MIG / right, MIG / left, FCAW / right, FCAW / left).
- Digital communication between the feeder and power source.
- Standard USB port of ease of upgrading wire feeder.

POWER-UP SEQUENCE

When the PipeFab™ is powered up, it can take as long as 60 seconds for the machine to be ready to weld. During this time period the user interface will not be active.

DUTY CYCLE

The duty cycle is based on a ten-minute period. A 40% duty cycle represents 4 minutes of welding and 6 minutes of idling in a ten-minute period. Refer to the Technical Specification section for the PipeFab™ duty cycle ratings.

MAKING A WELD

The serviceability of a product or structure utilizing the welding programs is and must be the sole responsibility of the builder / user. Many variables beyond the control of The Lincoln Electric Company affect the results obtained in applying these programs. These variables include, but are not limited to, welding procedure, plate chemistry and temperature, WeldMent design, fabrication methods and service requirements. The available range of a welding program may not be suitable for all applications, and the builder / user is and must be solely responsible for welding program selection.

Choose the electrode material, electrode size, shielding gas, and process (GMAW, GMAW-P etc.) appropriate for the material to be welded.

Select the weld mode that best matches the desired welding process. The standard weld set shipped with the PipeFab™ encompasses a wide range of common processes that will meet most needs.

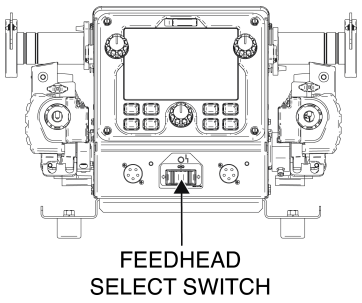
All adjustments are made through the user interface of the wire feeder.

USER INTERACTIONS

WIRE DRIVE SELECTION

Pressing the Feed head Select rocker towards the left side will activate the left wire drive while pressing the right side will activate the right wire drive. The active wire drive may also be selected by pulling the gun trigger on the left or right wire drive respectively. The green arrow on the top of either the left or right side of the user interface indicates the active wire drive.

When the active wire drive is switched, all parameters of the active drive from the last active procedure are loaded into the display.

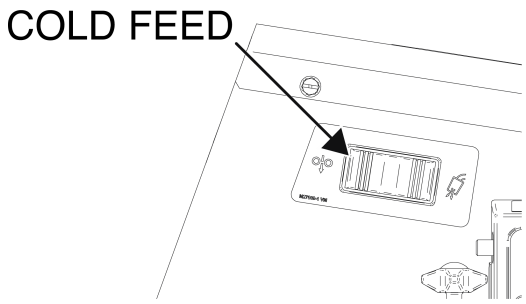


COLD FEED

Pressing the Cold Feed rocker switch feeds wire forward at the indicated speed for as long as the switch is held. When connected to the PipeFab™ Remote UI, Cold Feed may be active by the rocker switch on the side of the feeder or the rocker switch on the front of the Remote UI.

The power source output remains OFF during Cold Feeding.

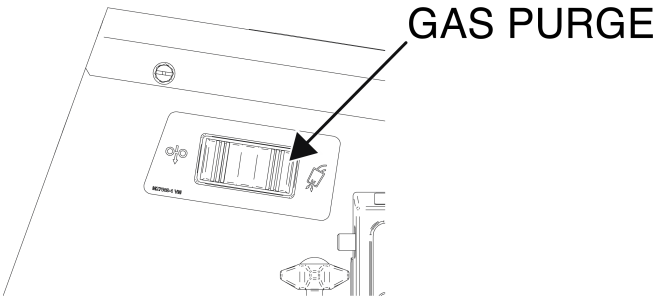
To set cold feed speed, turn the left knob while holding the cold feed button.



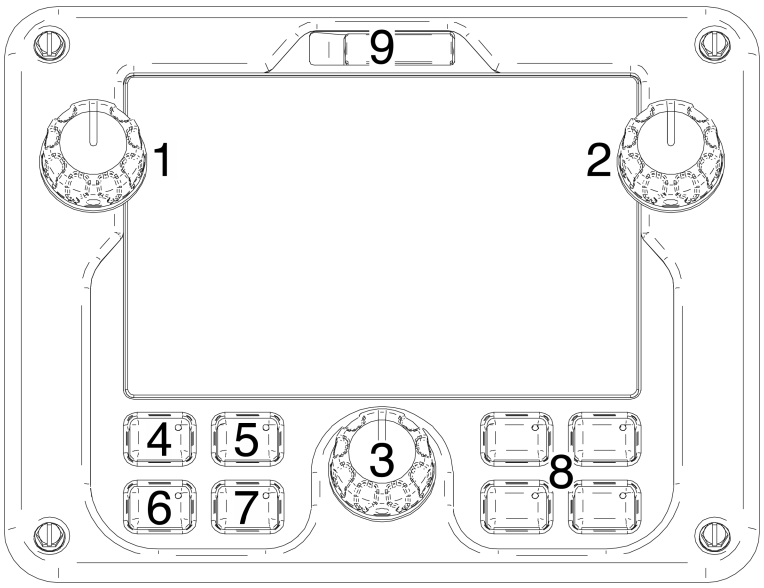
GAS PURGE

Pressing the Gas Purge rocker switch turns on the gas solenoid for as long as the gas purge switch is held. When connected to the PipeFab™ Remote UI, gas purge may be active by the rocker switch on the side of the feeder or the rocker switch on the front of the Remote UI.

The power source output remains OFF during Gas Purge.



USER INTERFACE LAYOUT

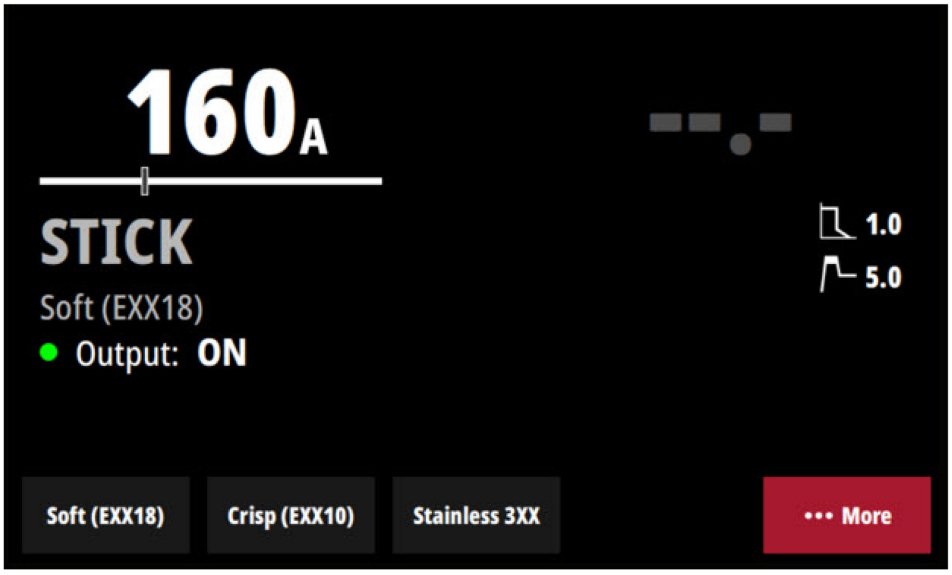


1. Process Adjustment Knob: Turn to adjust set point (dependent on the process).
2. Process Adjustment Knob: Turn to adjust set point (dependent on the process).
3. Menu Knob: Turn to scroll through the menu and press to select a highlighted option.
4. Stick Button: Press to set the system to Stick mode. This will deactivate all outputs besides the stick output.
5. TIG Button: Press to set the system to TIG mode. This will deactivate all outputs besides the TIG output.
6. MIG Button: Press to set the system to MIG mode. This will deactivate all outputs besides the MIG output.
7. FCAW Button: Press to set the system to FCAW mode. This will deactivate all outputs besides the FCAW output.
8. Memory Buttons: Memories can be saved for each welding mode. These can be accessed by touching the applicable memory button labeled one through four. To save a memory, hold the desired memory location down until the screen indicates the memory is saved.
9. USB Connector: A USB drive can be inserted to upload / download memories and update the user interface software.

USER INTERFACE NAVIGATION

Note: Simplified home screens are used by default. To see the Home Screens as shown in the examples, set the HOME SCREEN LAYOUT to ADVANCED.

STICK HOME SCREEN



1. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
2. Current Setting - sets the desired current, use the left knob to adjust. Enter the More Settings to adjust the allowable ranges to be set by a remote.
3. Electrode Type Selection - XX10, XX18.
4. Arc Force - Enter the More Settings to adjust the value. Only displayed when set to a non-zero value.
5. Hot Start - Enter the More Settings to adjust the value. Only displayed when set to a non-zero value.
6. Output Indicator.

   Note: Output is “ON” at all times in Stick process.

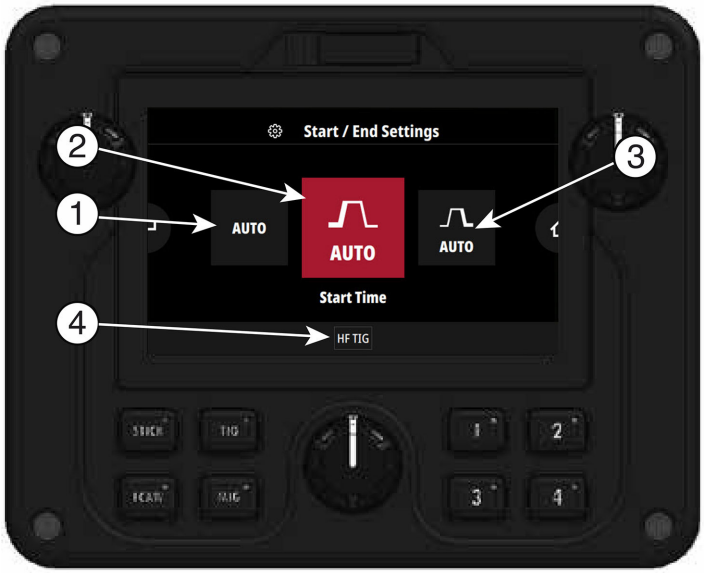
TIG HOME SCREEN



1. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
2. Current Setting - Sets the desired current, use left knob to adjust.
3. Start Type Selection - Touch Start, HF.
4. Post Flow Time - Time that the shielding gas continues to flow after the arc has been terminated. Only displayed when set to a non-zero value.
5. Pre-Flow Time - Time that the shielding gas continues to flow before the arc has been started. Only displayed when set to a non-zero value.
6. Output Indicator - Output will be on in Touch Start mode without a remote. Output will be off until triggered when a remote is connected.

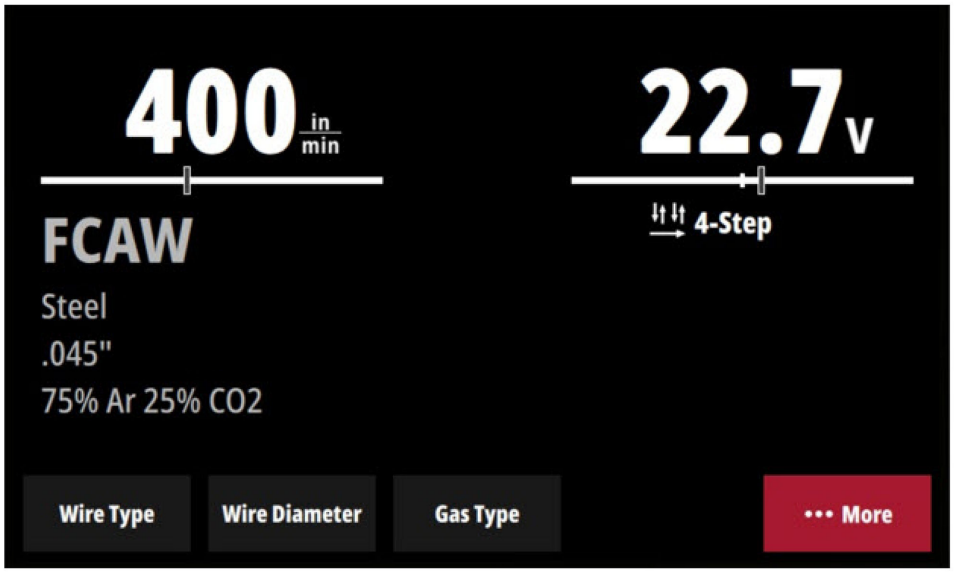
   Note: HF mode requires a remote to be connected.

TIG START / END SETTINGS



1. Set all to Auto - Start / End settings are set to “auto” by default. These settings are programmed based on process and set point to provide ideal welding.
2. Start Time - Controls the voltage for a specified time at the beginning of the weld. During that time, the machine will ramp from the Start Procedure to the Welding Procedure.
3. Crater Time - Controls the voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.
4. Current Settings.

FCAW HOME SCREEN

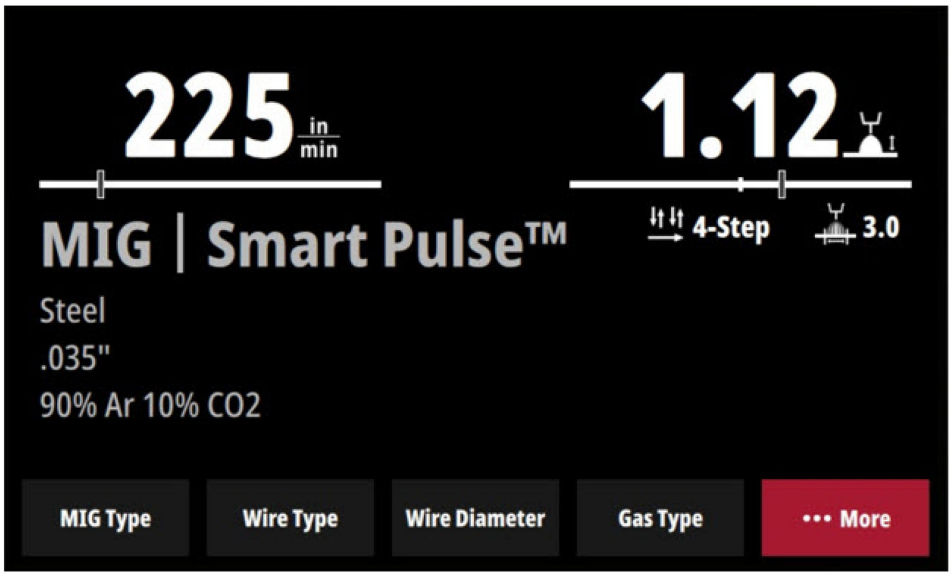


1. Feed head Indicator - Shows which side of the wire feeder is selected and ready for setup. The active side can be selected by pressing the Feed head Select Switch, Cold Feed Switch, or the gun trigger for the desired side.
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed, use left knob to adjust.
4. Voltage Setting - Sets the voltage, use right knob to adjust.
5. Wire Diameter Selection.
6. Gas Type Selection.
7. 2-Step / 4-Step Trigger Interlock - Toggles between 2-Step and 4-Step Trigger Interlock. 2-Step provides weld power and feeds wire only when the trigger is depressed. 4-Step eliminates the need to hold the trigger while welding. It operates in 4 steps:

   a. Close trigger and establish welding arc.
   b. Release trigger and continue welding.
   c. Re-close trigger near end of weld.
   d. Release trigger again to stop welding.

   Note: No symbol will be shown if 2-Step mode is active.

MIG HOME SCREEN

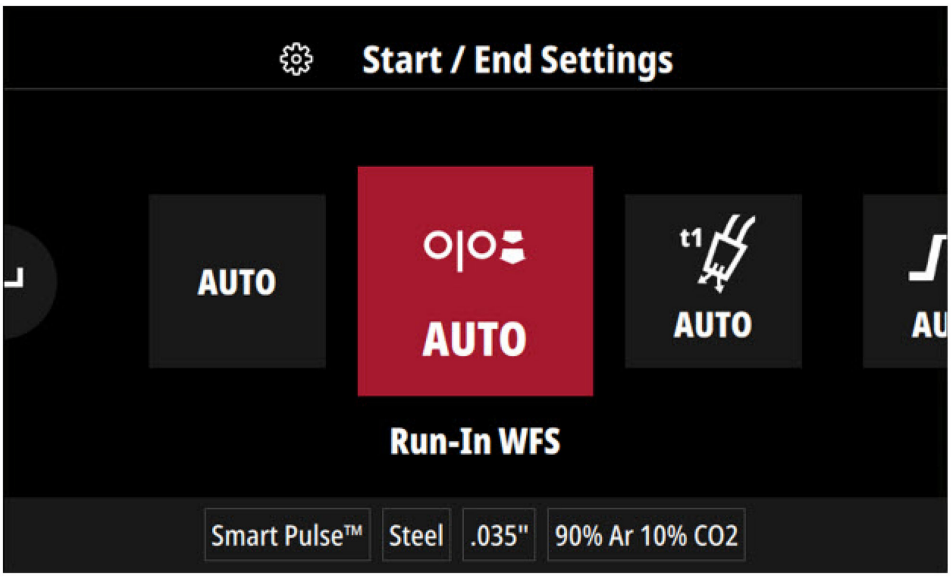


1. Feed head Indicator - Shows which side of the wire feeder is selected and ready for setup. The active side can be selected by pressing the Feed head Select Switch, Cold Feed Switch, or the gun trigger for the desired side.
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed, use left knob to adjust.
4. Voltage / Trim Setting - Sets the voltage or trim, use right knob to adjust.
5. MIG Mode Selection.
6. Wire Type Selection.
7. Wire Diameter Selection.
8. Gas Type Selection.
9. 2-Step / 4-Step Trigger Interlock - Toggles between 2-Step and 4-Step Trigger Interlock. 2-Step provides weld power and feeds wire only when the trigger is depressed. 4-Step eliminates the need to hold the trigger while welding. It operates in 4 steps:

   a. Close trigger and establish welding arc.
   b. Release trigger and continue welding.
   c. Re-close trigger near end of weld.
   d. Release trigger again to stop welding.

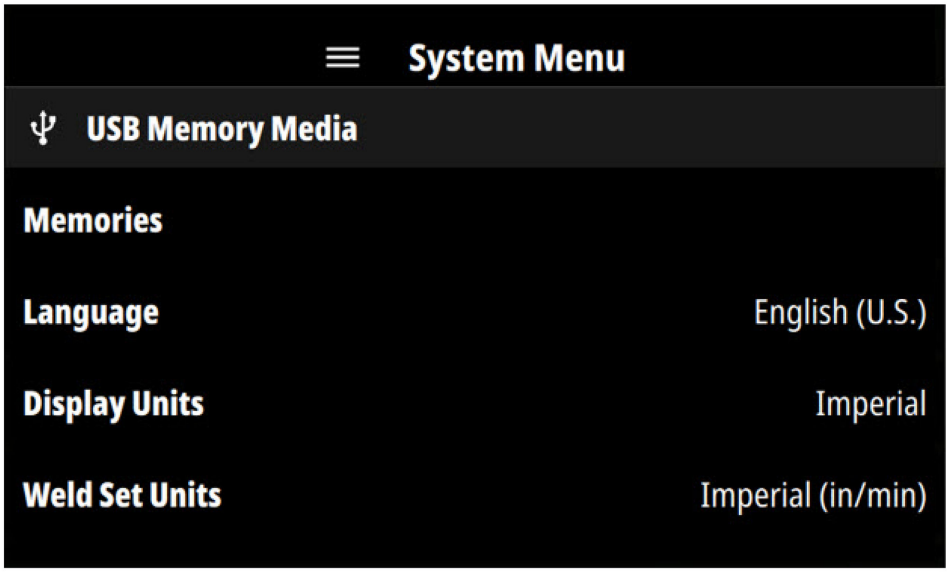
   Note: No symbol will be shown if 2-Step mode is active.
10. Ultimarc / Pinch - Ultimarc and Pinch regulate the focus or shape of the arc. Values greater than 0.0 increase the pulse frequency while decreasing the background current, resulting in a tight, stiff arc best for high speed sheet metal welding. Values less than 0.0 decrease the pulse frequency while increasing the background current, for a soft arc good for out-of-position welding. The MIG mode will determine if Ultimarc is used or Pinch.
11. Synergic Voltage Indicator - Nominal voltage is shown. Lowering the voltage below nominal will move the bar to the left. Raising the voltage above nominal will move the bar to the right.

FCAW / MIG START / END SETTINGS



1. Set all to Auto - Start / End settings are set to “auto” by default. These settings are programmed based on process and set point to provide ideal welding. The settings may be adjusted if desired.
2. Run-In - Allows adjusting the wire feed speed prior to the arc being established. A low run-in speed permits smooth arc starts. After the arc it's speed will change from run-in to welding wire feed speed. The run-in option is available in MIG and FCAW modes.
3. Pre-Flow Time - Adjusts the time that shielding gas flows before the welding output turns on.
4. Start Time - Controls the WFS and Volts for a specified time at the beginning of the weld. During the start time, the machine will ramp from the Start Procedure to the preset Welding Procedure.
5. Crater Time - Controls the WFS and voltage for a specified time at the end of the weld after the trigger is released. During the Crater time, the machine will ramp from the Weld Procedure to the Crater Procedure.
6. Burn back Time - Adjustable time delay between turning off the wire feed and turning off the arc. Burn back helps to prevent wire sticking to the puddle. The burn back feature will allow current to flow for a specified time period at the end of a weld after wire feeding has stopped.
7. Post Flow Time - Adjusts the time that shielding gas flows after the welding output turns off.
8. Current Settings.

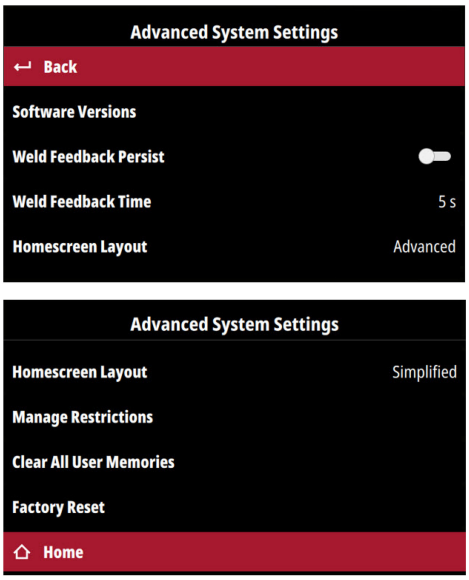
SYSTEM MENU



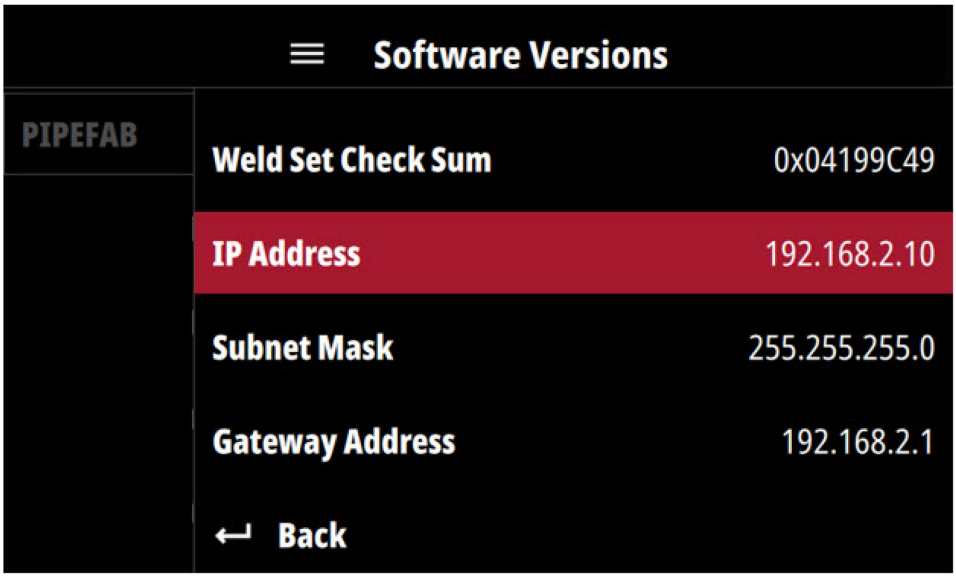
1. USB Memory Media Connected.
2. Memories - View the saved memories for each process.
3. Language - Language of the text present in the user interface.
4. Display Units - Selects the units to display wire feed speed, metric or imperial.
5. Water Cooler Operation - Determines when the optional K3737-1 PipeFab™ Cooler will run (not pictured).
6. Advanced System Settings (not pictured).

   Note: System Menu can only be accessed through the More Options menu.
7. Weld Set Units - Changes the weld set in use to be optimized for Imperial or metric units. Machine reset is required for this change to take effect. MIG and FCAW memories will be deleted when changing this setting.

ADVANCED SYSTEM SETTINGS



1. Software Versions - Allows access to a list of software components grouped by system component. Also lists the IP address of the Ethernet port. See Figure Below.

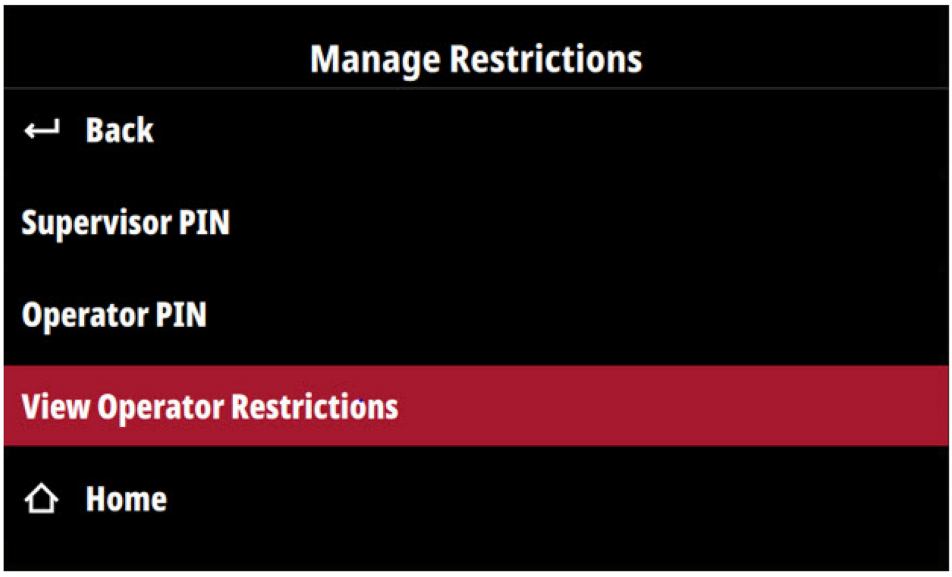


2. Weld Feedback Persist - When Weld Feedback Persist controls how long the actual welding voltage and current are displayed after completion of a weld. When Weld Feedback Persist is ON the actual welding voltage and current will remain on the display until the center knob on the display is turned or until the next weld starts. Weld Feedback Time is inactive when Weld Feedback Persist is ON.

   When Weld Feedback Persist is OFF the actual welding voltage and current will be displayed for the time specified in Weld Feedback Time or until the next weld starts.
3. Home Screen - Choose between Simplified (default) or Advanced. The Advanced Home Screen shows more details of parameters set by the user.
4. Manage Restrictions - Allows the user to create, set, or enter a Supervisor PIN, Operator PIN, and to view and change the Operator Restrictions. Enter the correct Supervisor PIN to enter the Supervisor Menu where the user can “Edit Operator Restrictions”.

If a supervisor becomes locked out of a machine because of a forgotten PIN number, PowerWave Manager can be used to unlock the machine and generate a new Supervisor PIN.

OPERATOR RESTRICTIONS



System Menu - OFF / ON, restricts changes to the System Menu.

Wave Controls - OFF / ON, restricts changes to Wave Controls (i.e. Pinch, Arc Force, Ultimarc).

Start / End Settings - OFF / ON, restricts changes to Start / End Settings.

Remote Range - OFF / ON, restricts changes to the Remote Range.

Trigger Interlock - OFF / ON, restricts changes to 2-step / 4-step settings.

Memory Only Mode - OFF / ON. Restricts the operator to only use processes and parameters stored in Memories. In Memory Only Mode, if no memory exists for a given process, that process button is disabled when using the associated side of the feeder. For example, if Memory Only Mode is ON and no memories are configured for a FCAW process on the left feeder, the machine cannot be put in FCAW mode when the left feeder is active.

Memory Modifications - Memory modifications can be ENABLED, so parameters can be resaved within the full range allowed by the machine. They can be DISABLED, so parameter cannot be resaved at all, or they can be resaved WITHIN LIMITS, to allow fine-tuning within preset limits.

SIMPLIFIED HOME SCREEN



1. Feed head Indicator - Shows which side of the wire feeder is selected and ready for setup. The active side can be selected by pressing the Feed head Select Switch, Cold Feed Switch, or the gun trigger for the desired side.
2. Menu Bar - Use the Menu knob to scroll through the options along the bottom of the screen. Press the knob to select the highlighted option.
3. Wire Feed Speed Setting - Sets the desired wire feed speed, use the left knob to adjust.
4. Voltage Setting - Sets the voltage, use the right knob to adjust.
5. Wire Type Selection.
6. Wire Diameter Selection.
7. Gas Type Selection.
8. Synergic Voltage Indicator - Nominal voltage is shown. Lowering the voltage below nominal will move the bar to the left. Raising the voltage above nominal will move the bar to the right.

   Note: In Simplified mode, advanced settings will not appear on the home screen even when set to a non-zero value.

MORE SETTINGS MENU (ALL PROCESSES)



1. Advanced settings will appear here. Each weld process will have different settings. The most common advanced settings are: Pinch, Arc Force, Hot Start, Pre-Flow Time, Post Flow Time, 2-Step / 4-Step Trigger, and Ultimarc. Advanced settings will only be displayed when set to a nonzero value.

PREVIOUS SETTING INDICATOR



1. Current Setting.
2. Previous Setting Indicator - The dotted line will indicate where on the bar the most recent setting was.
3. Current Setting Indicator - Increasing the value will move the bar to the right, decreasing the value will move the bar to the left.

WELDING SCREEN



1. Output Active.
2. Feed head Indicator - MIG and FCAW modes only.
3. Actual Current.
4. Actual Voltage.
5. Current Weld Settings.

BACK / HOME BUTTONS





1. Back Button - Selecting the back button takes the system back one screen.
2. Home Button - Selecting the home button takes the system back to the home screen.

MEMORY OPERATION



Memories can be saved for each welding process. These can be accessed by touching the applicable memory button labeled one through four.

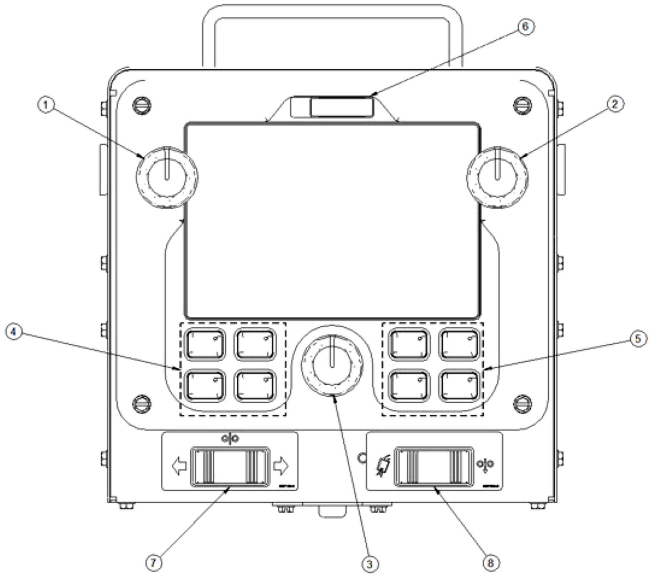
To save a memory, hold the desired memory location down until the screen indicates the memory is saved.

When one memory is selected the LED will be lit, if any settings are changed the LED will go out. If the memory button is pressed again, the settings will revert to the settings saved in the memory.

Four memories each can be saved in the Stick process, TIG process, MIG Left Feed head, MIG Right Feed head, FCAW Left Feed head, and FCAW Right Feed head.

Memory usage with remotes - If a TIG process is saved with a remote control connected, the remote control must be connected for the memory to be functional. If Memory Only Mode is not enabled, a warning will appear and can be bypassed.

FRONT PANEL CONTROLS OF REMOTE UI



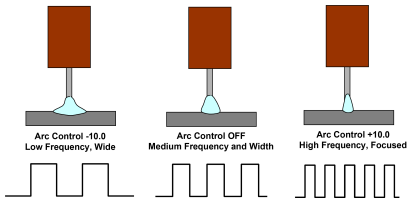
1. Process Adjustment Knob: Turn to adjust set point (dependent on the process).
2. Process Adjustment Knob: Turn to adjust set point (dependent on the process).
3. Menu Knob: Turn to scroll through the menu and press to select a highlighted option.
4. Process Buttons: Press to select the welding process type (Stick, TIG, MIG, FCAW).
5. Memory Buttons: Memories can be saved for each process type. These can be accessed by touching the applicable memory button labeled one through four. To save a memory, hold the desired memory location down until the screen indicates the memory is saved. The remote UI has its own set of memories. These are not shared with the memories stored in the wire feeder UI.
6. USB Connector: A USB drive can be inserted to upload / download memories and update the user interface software.
7. Feed head Select Switch: Allows user to select left or right feed head to be active. A feed head can also be activated by closing a gun trigger.
8. Cold Feed / Gas Purge Switch: Cold feed will feed wire on the active feed head when pressed. Gas purge will activate the gas solenoid on the active feed head when pressed.

USER INTERFACE PROGRAMMING

- Connect the 5-pin control cable from the wire feeder to the 5-pin connector on the PipeFab™ power source.
- Turn on the power to the wire feeder and wait for the initialization sequence to complete.
- Insert the USB stick into the USB port on the user interface.
- A message will appear asking if you want to perform a Display Software Update. Turn the center knob to highlight “Yes” in red. Press the center knob to start the update.
- Once a message appears stating display updated successfully, the unit will restart and return to a typical welding screen.
- Remove the USB stick from the USB port.

New user interface software can be found at powerwavesoftware.com.

WAVE CONTROL

PROCESS	WAVE CONTROL NAME	EFFECT / RANGE	DESCRIPTION
STICK	ARC FORCE	SOFT (-10.0) TO CRISP (10.0)	ARC FORCE ADJUSTS THE SHORT CIRCUIT CURRENT FOR A SOFT ARC, OR FOR A FORCEFUL, DRIVING ARC. IT HELPS TO PREVENT STICKING AND SHORTING OF ORGANIC COATED ELECTRODES, PARTICULARITY GLOBULAR TRANSFER TYPES SUCH AS STAINLESS AND LOW HYDROGEN. ARC FORCE IS ESPECIALLY EFFECTIVE FOR ROOT PASS ON PIPE WITH STAINLESS ELECTRODE AND HELPS TO MINIMIZE SPATTER FOR CERTAIN ELECTRODES AND PROCEDURE AS WITH LOW HYDROGEN, ETC.
MIG AND FCAW	PINCH	SOFT (-10.0) TO CRISP (10.0)	PINCH CONTROLS THE ARC CHARACTERISTICS WHEN SHORT-ARC WELDING.
MIG	ULTIMARC	SOFT (-10.0) TO STIFF (10.0)	ULTIMARC REGULATES THE FOCUS OR SHAPE OF THE ARC. ULTIMARC VALUES GREATER THAN 0.0 INCREASE THE PULSE FREQUENCY WHILE DECREASING THE BACKGROUND CURRENT, RESULTING IN A TIGHT, STIFF ARC BEST FOR HIGH SPEED SHEET METAL WELDING. ULTIMARC VALUES LESS THAN 0.0 DECREASE THE PULSE FREQUENCY WHILE INCREASING THE BACKGROUND CURRENT, FOR A SOFT ARC GOOD FOR OUT-OF-POSITION WELDING. 
TIG	NO WAVE CONTROLS AVAILABLE.	---	---

TRIGGER SELECTION

2-STEP TRIGGER

2-Step Trigger controls the welding sequence in direct response to the trigger. When the gun trigger is pulled, the welding system (power source and wire feeder) cycles through the arc starting sequence and into the main welding parameters. The welding system will continue to weld as long as the gun trigger is activated. Once the trigger is released, the welding system cycles through the arc ending steps.

Table 15 :Example 1: 2-Step Trigger: Simple operation.

The simplest trigger operation occurs with a 2-Step trigger and Start and Crater set to OFF.

For this sequence,

PRE-FLOW:	Shielding gas begins to flow immediately when the gun trigger is pulled.
RUN-IN:	After pre-flow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 2.0 seconds, the wire feed speed will jump to the welding wire feed speed.
WELD:	The power source output and the wire feed speed continue at the weld settings for as long as the trigger is pulled.
POST FLOW:	As soon as the trigger is released, the power source output and the wire feed speed are turned OFF. Shielding gas continues until the post flow timer expires.

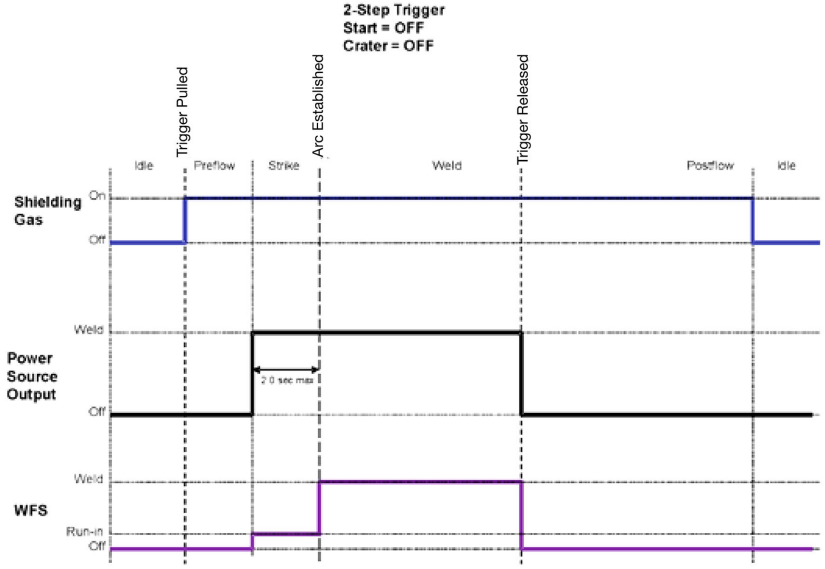


Table 16 :Example 2: 2-Step Trigger: Improved Arc Start and Arc End.

Tailoring the arc start and arc end is a common method for reducing spatter and improving weld quality. This can be accomplished with the Start and Burn back functions set to a desired value and Crater set to OFF.

For this sequence,

PRE-FLOW:	Shielding gas begins to flow immediately when the gun trigger is pulled.
RUN-IN:	After pre-flow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 2.0 seconds, the power source output and wire feed speed skips to the weld settings.

START: Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

WELD: After upslope, the power source output and the wire feed speed continue at the weld settings.

BURN BACK: As soon as the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burn back time.

POST FLOW: Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.

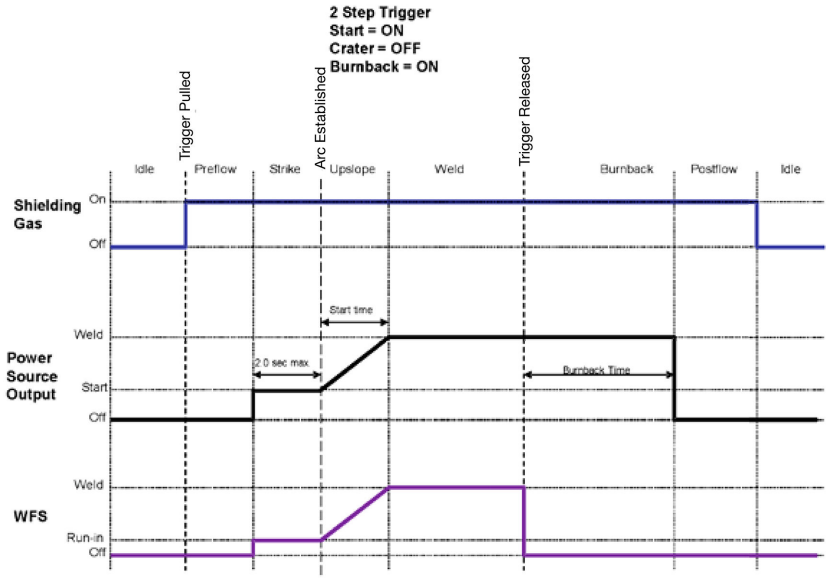


Table 17 :Example 3: 2-Step Trigger: Customized Arc Start, Crater and Arc End.

For this sequence,

PRE-FLOW: Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN: After pre-flow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 2.0 seconds, the power source output and wire feed speed skips to the weld settings.

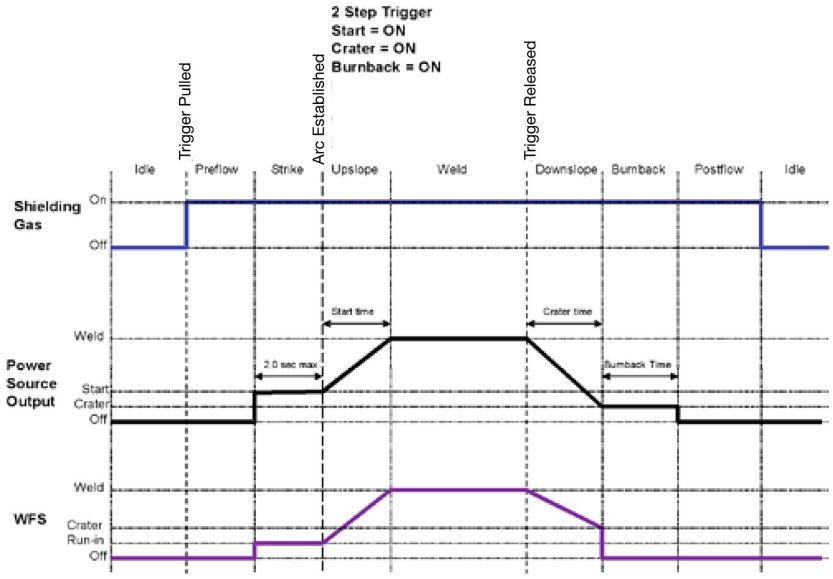
START & UPSLOPE: Once the wire touches the work and an arc is established, both the machine output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE.

WELD: After upslope, the power source output and the wire feed speed continue at the weld settings.

CRATER & DOWNSLOPE: As soon as the trigger is released, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

BURN BACK: After the crater time expires, the wire feed speed is turned OFF and the machine output continues for the burn back time.

POST FLOW: Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.



2-STEP TRIGGER: SPECIAL CONSIDERATIONS

The weld sequence response depends upon when the trigger is pulled and released and whether or not START or CRATER are active.

An example sequence:

Pull the trigger to start feed of wire. When arc is established the sequencer will begin START / UPSLOPE. If trigger is released during UPSLOPE and CRATER / DOWNSLOPE is active, the machine will begin CRATER / DOWNSLOPE and sloping down over the CRATER time, regardless of when the trigger release occurred.

If the CRATER is disabled and the trigger is released during START / UPSLOPE, the sequencer will move to the BURN BACK state to end the weld.

4-STEP TRIGGER

4-step trigger allows the operator to release the trigger once an arc has been established. To end the weld, the trigger is pulled and then released again.

Two types of 4-Step Trigger are available. Use the set-up menu to select the desired type of operation.

With current interlock, if the arc goes out for more than 0.5 seconds while the trigger is released, the welding process stops and goes to the idle state.

Without the current interlock, if the arc goes out while the trigger is released, output to the power source remains on and the wire feeder will continue to feed wire.

Table 18 :Example 1: 4-Step Trigger: Trigger Interlock.

The 4-Step trigger can be configured as a trigger interlock. Trigger interlock adds to the welder’s comfort when making long welds by allowing the trigger to be released after an initial trigger pull. Welding stops when the trigger is pulled a second time and then released, or if the arc is interrupted.

For this sequence,
PRE-FLOW: Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN: After pre-flow time expires, the power source regulates to the welding output and wire is advanced towards the work piece at the Run-In WFS. If an arc is not established within 1.5 seconds, the wire feed speed will jump to the welding wire feed speed.

WELD: The power source output and the wire feed speed continue at the weld settings. The trigger is released and welding continues. Welding continues when the trigger is pulled a second time.

POST FLOW: As soon as the trigger is released for the second time, the power source output and the wire feed speed are turned OFF. Shielding gas flows until the post flow timer expires.

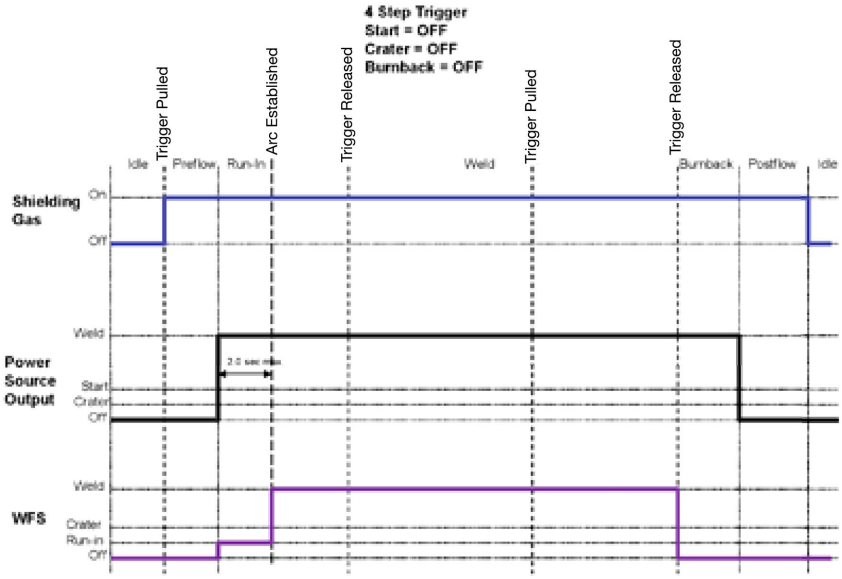


Table 19 :Example 2: 4-Step Trigger: Manual Control of Start and Crater times with Burn back ON.

The 4-Step trigger sequence gives the most flexibility when the Start, Crater and Burn back functions are active. With 4-Step trigger, the welder chooses the amount of time to weld at the Start, Weld and Crater settings by using the gun trigger. Burn back reduces the occurrence of wire to sticking into the weld pool at the end of a weld and conditions the end of the wire for the next arc start.

In this sequence,

PRE-FLOW: Shielding gas begins to flow immediately when the gun trigger is pulled.

RUN-IN: After pre-flow time expires, the power source regulates to the start output and wire is advanced towards the work piece at the run-in WFS. If an arc is not established within 2.0 seconds, the power source output and wire feed speed skips to the weld settings.

START: The power source welds at the start WFS and voltage until the trigger is released.

UPSLOPE: During upslope, the power source output and the wire feed speed ramp to the weld settings throughout the start time. The time period of ramping from the start settings to the weld settings is called UPSLOPE. If the trigger is pulled before upslope is complete, WELD is skipped and the sequence jumps to DOWNSLOPE.

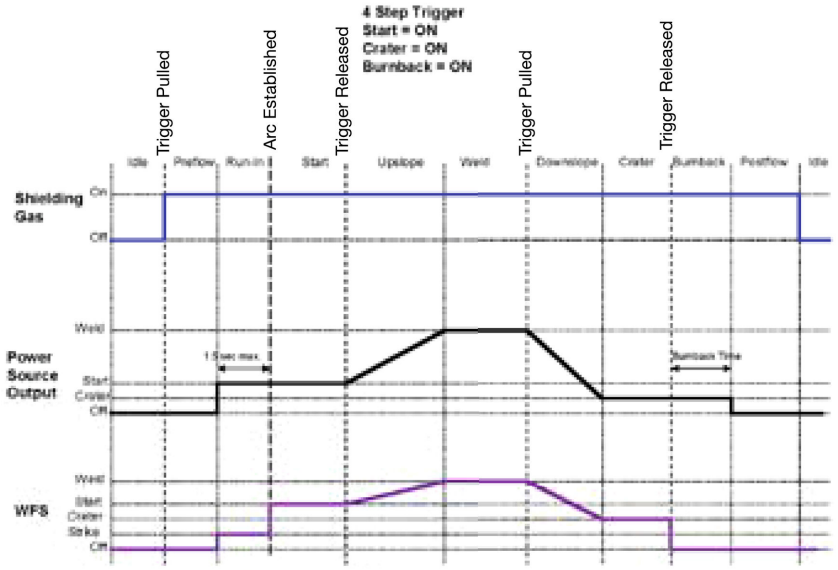
WELD: After upslope, the power source output and the wire feed speed continue at the weld settings.

DOWNSLOPE: As soon as the trigger is pulled, the wire feed speed and power source output ramp to the crater settings throughout the crater time. The time period of ramping from the weld settings to the crater settings is called DOWNSLOPE.

CRATER: During CRATER, the power source continues to supply output at the crater WFS and voltage.

BURN BACK: When the trigger is released, the wire feed speed is turned OFF and the machine output continues for the burn back time.

POST FLOW: Next, the machine output is turned OFF and shielding gas continues until the post flow timer expires.



4-STEP TRIGGER: SPECIAL CONSIDERATIONS

The response to the trigger with 4-step trigger active is dependent upon when the trigger is pulled / released and the settings for START and CRATER.

Example 1:

Pull the trigger to start feed of wire. When arc is established the sequencer will remain in START until the trigger is released. When the trigger is released, UPSLOPE begins. If trigger is pulled again during UPSLOPE and CRATER / DOWNSLOPE is active, the feeder will begin the DOWNSLOPE, sloping down over the CRATER time, regardless of when the trigger pull occurred.

If the CRATER / DOWNSLOPE state is disabled and the trigger is pulled during UPSLOPE, the sequencer will remain in the UPSLOPE state and continue with the weld. If the fourth step (trigger release) occurs during UPSLOPE, the sequencer will jump to the BURN BACK to end the weld.

Example 2:

Pull the trigger to start feed of wire. When arc is established the sequencer will remain in START until the trigger is released. When the trigger is released, UPSLOPE begins and continues into WELD when the START timer is complete. When the trigger is pulled again (step 3) and CRATER / DOWNSLOPE is active, DOWNSLOPE begins and continues until the CRATER timer expires, at which time CRATER will be entered until the trigger is released.

While in DOWNSLOPE, if the trigger is released before the timer expires, the trigger will be ignored and the DOWNSLOPE state will continue until the timer expires, at which point CRATER state will be enabled, check for trigger, and jump to BURN BACK since the trigger has been released.

While in the DOWNSLOPE state and the trigger is released and then pulled again, it will be ignored. During 4-Step operation in DOWNSLOPE, the trigger will always be ignored.

START OPTIONS

The Start Options available depend upon the process and weld mode selected.

PROCESS	START OPTION	EFFECT / RANGE	DESCRIPTION
STICK	---	---	---
ALL MIG AND FCAW	PRE-FLOW TIME	0 - 60.0 SECONDS	
	RUN-IN WFS	AUTO, OFF, 50 - 150 IN / MIN TO WELD WFS	RUN-IN SETS THE WIRE FEED SPEED FROM THE TIME THE TRIGGER IS PULLED UNTIL AN ARC IS ESTABLISHED OR 2.5 SECONDS. USE RUN-IN FOR SOFTER ARC STARTS.
	START TIME, WFS AND VOLTS	0 - 10.0 SECONDS	THE START PROCEDURE CONTROLS THE WFS AND VOLTS FOR A SPECIFIED TIME AT THE BEGINNING OF THE WELD. DURING THE START TIME, THE MACHINE WILL RAMP UP OR DOWN FROM THE START PROCEDURE TO THE PRE-SET WELDING PROCEDURE.
TIG	PRE-FLOW TIME	0 - 60.0 SECONDS	---

END OPTIONS

The End Options available depend upon the process and weld mode selected.

PROCESS	START OPTION	EFFECT / RANGE	DESCRIPTION
STICK	---	---	---
ALL MIG AND FCAW	CRATER TIME, WFS AND VOLTS	0 - 10.0 SECONDS	CRATER PROCEDURE CONTROLS THE WFS AND VOLTS FOR A SPECIFIED TIME AT THE END OF THE WELD AFTER THE TRIGGER IS RELEASED. DURING THE CRATER TIME, THE MACHINE WILL RAMP UP OR DOWN FROM THE WELD PROCEDURE TO THE CRATER PROCEDURE. CRATER IS NOT COMMONLY USED WITH STT PROCESSES.
	BURN BACK TIME	AUTO, 0 - 0.25 SECONDS	THE BURN BACK TIME IS THE AMOUNT OF TIME THAT THE WELD OUTPUT CONTINUES AFTER THE WIRE FEEDING STOPS. IT PREVENTS THE WIRE FROM STICKING IN THE PUDDLE AND PREPARES THE END OF THE WIRE FOR THE NEXT ARC START.
	POST FLOW TIME	0 - 60.0 SECONDS	ADJUSTS THE TIME THAT SHIELDING GAS FLOWS AFTER THE WELDING OUTPUT TURNS OFF.
TIG	POST FLOW TIME	0 - 60.0 SECONDS	ADJUSTS THE TIME THAT SHIELDING GAS FLOWS AFTER THE WELDING OUTPUT TURNS OFF.

ACCESSORIES AND OPTIONS

FIELD INSTALLED OPTIONS

All Kits Options and Accessories are found on the Website: (www.lincolnelectric.com).

PipeFab™ Kits

K NUMBER	DESCRIPTION
K3736-1	PipeFab™ UNDERCARRIAGE
K3737-1	PipeFab™ COOLER
K3738-1	PipeFab™ REMOTE UI

PROCESS SPECIFIC KITS

K NUMBER	DESCRIPTION	INCLUDED / PURPOSE
STICK OPTIONS		
K875	ACCESSORY KIT - 150 AMP	INCLUDES 20 FT. (6.1 M) #6 ELECTRODE CABLE WITH LUG, 15 FT. (4.6 M) #6 WORK CABLE WITH LUGS, HEAD SHIELD, FILTER PLATE, WORK CLAMP, ELECTRODE HOLDER AND SAMPLE PACK OF MILD STEEL ELECTRODE.
K704	ACCESSORY KIT - 400 AMP	INCLUDES 35 FT. (10.7 M) 2/0 ELECTRODE CABLE WITH LUG, 30 FT. (9.1 M) 2/0 WORK CABLE WITH LUGS, HEAD SHIELD, FILTER PLATE, WORK CLAMP AND ELECTRODE HOLDER.
TIG OPTIONS		
-	PRO-TORCH™ TIG TORCHES	A FULL LINE OF AIR-COOLED AND WATER-COOLED TORCHES AVAILABLE.
K963-4	HAND AMPTROL®	PROVIDES 25 FT. (7.6 M) OF REMOTE CURRENT CONTROL FOR TIG WELDING.
K870-2	FOOT AMPTROL®	PROVIDES 25 FT. (7.6 M) OF REMOTE CURRENT CONTROL FOR TIG WELDING.

WELDING FUME EXTRACTORS

Lincoln offers a wide range of fume extraction environmental system solutions, ranging from portable systems easily wheeled around a shop to shop-wide central systems servicing many dedicated welding stations.

DRIVE ROLL AND WIRE GUIDE KITS

DRIVE ROLL KITS, STEEL WIRES		
KP1505-030S	.023 - .030" (0.6 - 0.8 MM)	INCLUDES: 4 SMOOTH V-GROOVE DRIVE ROLLS AND INNER WIRE GUIDE.
KP1505-035S	.035" (0.9 MM)	
KP1505-045S	.045" (1.2 MM)	
KP1505-052S	.052" (1.4 MM)	
KP1505-1/16S	1/16" (1.6 MM)	
KP1505-1	.035, .045" (0.9, 1.2 MM)	
KP1505-2	.040" (1.0 MM)	
DRIVE ROLL KITS, CORED WIRES		
KP1505-035C	.030 - .035" (0.8 - 0.9 MM)	INCLUDES: 4 KNURLED DRIVE ROLLS AND INNER WIRE GUIDE.
KP1505-045C	.040 - .045" (1.0 - 1.2 MM)	
KP1505-052C	.052" (1.4 MM)	
KP1505-1/16C	1/16" (1.6 MM)	
DRIVE ROLL KITS, STEEL OR CORED WIRES		
KP1505-068	.068 - .072" (1.8 MM)	INCLUDES: 4 KNURLED DRIVE ROLLS AND INNER WIRE GUIDE.
KP1505-5/64	5/64" (2.0 MM)	

GUN ADAPTER KITS

K NUMBER	DESCRIPTION
K3344-1	GUN ADAPTER KIT, LINCOLN BACK-END. INCLUDES A GUIDE TUBE KIT.
KP4069-1	GUIDE TUBE KIT FOR K3344-1 LINCOLN GUN ADAPTERS.
K3345-1	GUN ADAPTER KIT, STANDARD #2 - #4 BACK-END.
K3346-1	GUN ADAPTER KIT, STANDARD #5 BACK-END.
K3347-1	GUN ADAPTER KIT, MILLER BACK-END.
K3348-1	GUN ADAPTER KIT, OXO BACK-END. INCLUDES A GUIDE TUBE KIT.
KP4069-2	GUIDE TUBE KIT FOR K3348-1 OXO GUN ADAPTERS.
K3349-1	GUN ADAPTER KIT, FAST-MATE (EURO). INCLUDES A GUIDE TUBE KIT.
KP4069-3	GUIDE TUBE KIT FOR K3349-1 FASTMATE GUN ADAPTERS.

CABLE AND LEAD KITS

K NUMBER	DESCRIPTION	PURPOSE
CONTROL CABLES		
K1543-XX	CONTROL CABLE: MALE 5 PIN TO FEMALE 5 PIN ARCLINK CABLE.	CONNECTS THE USER INTERFACE TO THE WIRE DRIVE FOR BOOM SYSTEMS. CONNECTS THE WIRE DRIVE TO THE POWER SOURCE ON BENCH SYSTEMS.
K2683-XX	HEAVY-DUTY CONTROL CABLE: MALE 5 PIN TO FEMALE 5 PIN ARCLINK CABLE.	CONNECTS THE USER INTERFACE TO THE WIRE DRIVE FOR BOOM SYSTEMS. CONNECTS THE WIRE DRIVE TO THE POWER SOURCE ON BENCH SYSTEMS.
SENSE LEADS		
K940-XX K1811-XX	WORK VOLTAGE SENSE LEAD KIT	REQUIRED TO ACCURATELY MONITOR VOLTAGE AT THE ARC
ADAPTERS		
K2909-1	12 PIN TO 6 PIN ADAPTER	-
K2910-1	12 PIN TO 7 PIN ADAPTER	
COAXIAL WELDING CABLES		
K1796-XX	AWG 1/0 COAXIAL CABLE	OPTIMUM WELD CABLES FOR MINIMIZING CABLE INDUCTANCE AND OPTIMIZING WELDING PERFORMANCE.
K2593-XX	AWG #1 COAXIAL CABLE	

GENERAL ACCESSORIES

K NUMBER	DESCRIPTION	NOTES
K1546-1	INCOMING BUSHING FOR LINCOLN CONDUIT	USE WITH .025 - 1/16" WIRES.
K1546-2	INCOMING BUSHING FOR LINCOLN CONDUIT	USE WITH 1/16" TO 1/8" WIRES.
K1733-1	WIRE STRAIGHTENER	STRAIGHTEN WELDING WIRE TO IMPROVE FEEDING
K590-6	WATER CONNECTION KIT	PROVIDES WATER CONNECTIONS UNDER FEED PLATE
K1634-4	WIRE REEL ENCLOSURE	FOR USE WITH 30 - 40 LB SPOOLS
K4728-1	CASTER KIT	TO CONVERT WIRE REEL BASE TO A FEEDER UNDERCARRIAGE
K1555-1	INSULATED LIFT BALE	TO PROVIDE A LIFTING MECHANISM ON THE WIRE REEL STAND
K4719-1	REMOTE TRIGGER SWITCH	25 FOOT HAND HELD TRIGGER
K586-1	DELUXE ADJUSTABLE GAS REGULATOR & HOSE KIT	ACCOMMODATES CO_2, ARGON, OR ARGON-BLEND GAS CYLINDERS. INCLUDES A CYLINDER PRESSURE GAUGE, DUAL SCALE FLOW GAUGE AND 4.3 FT. (1.3 M) GAS HOSE.

ACCESSORIES INCLUDED WITH THE PipeFab™ FEEDER

- Wire drives include a Standard #2 - #4 gun adapter.
- 30 tooth pinion gear installed.
- Inlet guides installed.
- Wire Reel Stand.
- Four cable management brackets.

MAINTENANCE

SAFETY PRECAUTIONS

READ AND UNDERSTAND ENTIRE SECTION BEFORE OPERATING MACHINE.

⚠ WARNING



ELECTRIC SHOCK can kill.

Do not operate with covers removed.

Turn off power source before installing or servicing.

Do not touch electrically hot parts.

Turn the input power to the welding power source off at the fuse box before working in the terminal strip.

Only qualified personnel should install, use or service this equipment.

ROUTINE MAINTENANCE

Routine maintenance consists of periodically blowing out the machine, using a low-pressure air stream, to remove accumulated dust and dirt from the intake and outlet louvers, and the cooling channels in the machine.

Check weld cables, control cables and gas hoses for cuts.

Clean and tighten all weld terminals.

PERIODIC MAINTENANCE

Calibration of the PipeFab™ is critical to its operation. Generally speaking the calibration will not need adjustment. However, neglected or improperly calibrated machines may not yield satisfactory weld performance. To ensure optimal performance, the calibration of output Voltage and Current should be checked yearly.

Clean the drive rolls and inner wire guide and replace if worn.

Blow out or vacuum the inside of the feeder.

Inspect the motor brushes every 6 months. Replace if shorter than 0.5" (12.7 mm).

Every year inspect the gearbox and coat the gear teeth with a moly-disulfide filled grease. DO NOT use graphite grease.

CALIBRATION SPECIFICATION

Output Voltage and Current are calibrated at the factory. Generally the machine calibration will not need adjustment. However, if the weld performance changes, or the yearly calibration check reveals a problem, use the calibration section of the Diagnostics Utility to make the appropriate adjustments.

The calibration procedure itself requires the use of a grid, and certified actual meters for voltage and current. The accuracy of the calibration will be directly affected by the accuracy of the measuring equipment you use. The Diagnostics Utility includes detailed instructions and is available at www.powerwavesoftware.com.

TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING



Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

1. **LOCATE PROBLEM (SYMPTOM)**

   Look under the column labeled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

2. **POSSIBLE CAUSE**

   The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

3. **RECOMMENDED COURSE OF ACTION**

   This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

⚠ CAUTION



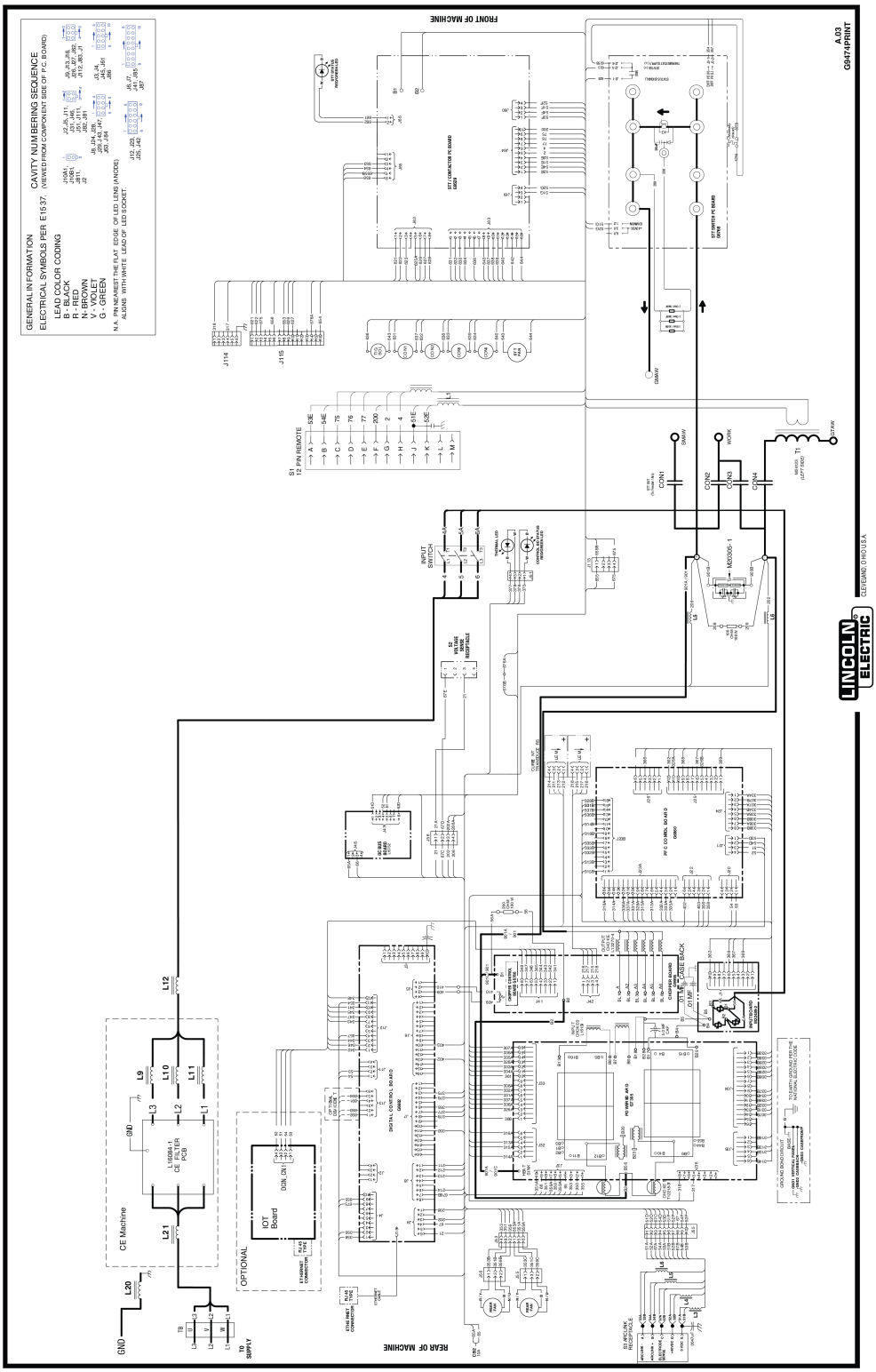
If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

Observe all additional safety guidelines detailed throughout this manual.

DIAGRAMS & PRINTS

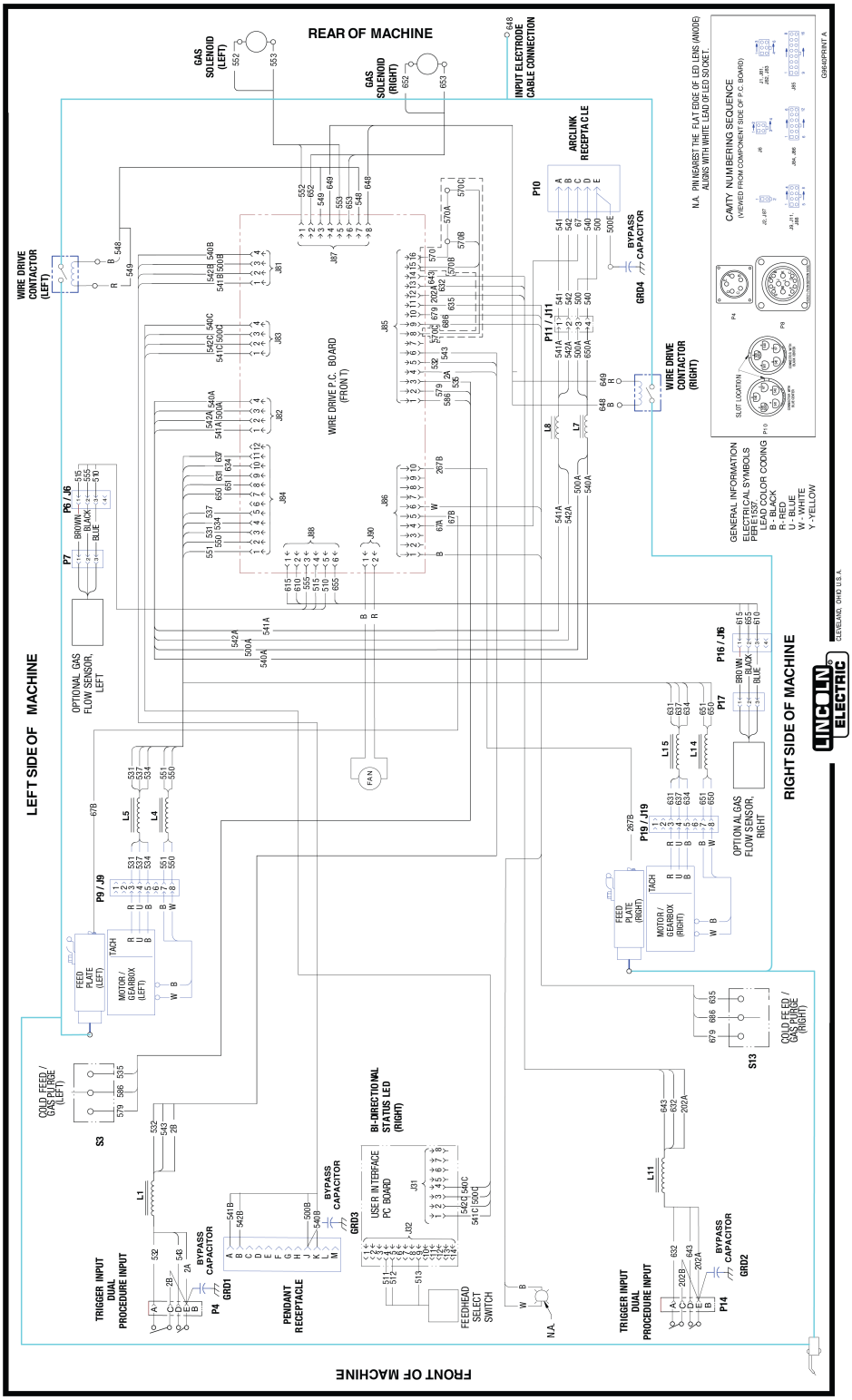
WIRING DIAGRAMS

PIPEFAB POWER SOURCE (Code 12858)



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

PIPEFAB WIRE FEEDER (Code 12929)



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

APPENDIX

CUSTOMER ASSISTANCE POLICY

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, and cutting equipment. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation or application. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

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

WELD FUME CONTROL EQUIPMENT

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

PARTS LIST

Content/Details may be changed or updated without notice. For most current Instruction Manuals, go to PARTS.LINCOLNELECTRIC.COM.