



Model 205 Tube Welding Power Supply



Operator's Manual

Part No. 740108
Revision J

INTRODUCTION

The Model 205 is a power source and controller for automatic orbital tube welding. It is intended to be used only in conjunction with AMI or EXEL orbital tube weldheads. The Model 205 power supply provides GTAW (Gas Tungsten Arc Welding) current with pulsation controls, high frequency arc starting, purge gas controls, weldhead arc rotation and automatic timing functions. Users need only to supply input AC power, a regulated gas source with flow meter and the appropriate weldhead.

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Revision History

Rev	ECO No.	Change Description	Date	Appr.
A	N/A	Initial release	3/10/09	B.F.
B	5355	Update sections 2.0, 3.0, 4.0, 5.0 & 6.0; delete Glossary	5/14/09	B.F.
C	5411	Update section 4.10.9 Performing a Weld	07/06/09	B.F.
D	5447	CE changes	12/30/09	D.C.
E	5713	Correct table in Section 6.1.2 with correct weight	06/16/10	D.C.
F	5817	Incorporate S/W v1.5, corrections for CE changes, add power grounded to section 2.0, update obsolete data	12/08/10	D.C.
G	6346	Incorporate M21 W/H information, add changes to Run screen, add Associated Data look-up tables, add information on system initiate 0.5 second delay, add information on +1%/-1% buttons, update UK address.	06/15/12	D.C.
H	6518	Section 6.2, changed picture of Remote Pendant (pg51)	3/20/13	BL
J	6646	Add Weld Data Recording functionality and update applicable screens	2/25/14	W.O.

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1.0 SAFETY PRECAUTIONS

The Model 205 is intended to be used only with AMI or EXEL weldheads for the purpose of GTAW welding of metal tube. The system is not to be used for any other purpose, specifically heating or cutting.

WARNING

ICON KEY	
	Warning
	Electrical Hazard

The nature of the GTAW process creates some POTENTIAL HAZARDS. In accordance with international safety regulations the EXCLAMATION SYMBOL indicates that this equipment is considered HAZARDOUS. The LIGHTNING FLASH SYMBOL indicates that there are potential electrical hazards. The use and display of these symbols make it the **OPERATOR'S RESPONSIBILITY TO ENSURE**

THAT HE HAS READ AND/OR BEEN MADE AWARE OF ALL OF THE SAFETY-RELATED ITEMS CONTAINED IN THIS MANUAL.

1.1 SHOCK HAZARD WARNING

HIGH VOLTAGE is present on exposed internal terminals. The ELECTRODE (tungsten / weldhead rotor) is also an EXPOSED TERMINAL and by its nature the GTAW process requires electrical potential to be present on the electrode during arc starting and during welding.



All AMI Power Supplies contain a “bleeder” circuit to ground any residual potential after welding or after an aborted or bad arc start attempt. These circuits take a few seconds to operate or could fail.



The electrode should always be considered a possible shock hazard. This is especially true when the system is in “weld sequence”, ready to weld, is welding or has just finished welding. Equipment/component failure, system abuse or improper maintenance could result in electrical potential at the weldhead even when not in “weld sequence”.



The users/operators of this equipment must take all precautions necessary to avoid contact with the ELECTRODE at “ALL TIMES”. The only exception is when actually replacing or adjusting the electrode and this should be done WITH THE POWER TURNED OFF.



If performed with the power “ON” the system must be in “TEST” mode out of weld sequence and the USER MUST OBSERVE COMMON SAFETY PRACTICES such as grounding the electrode to ensure discharge before actually touching it.



Most AMI Power Supplies feature High Frequency (HF) Arc Starting. This is a High Voltage/High Frequency electrical transmission process. To eliminate any HF shock possibility “AVOID ALL CONTACT” with the Welding WORK (ground), the ELECTRODE or the WELDHEAD during arc start.



Remember, there is a possible shock hazard in all welding power supplies at ALL times.

1.2 WARNING LABEL DEFINITIONS

The table below contains caution and warning labels for the operation of this equipment. Before operating this or any welding equipment users should be familiar with **ANSI-49.1 Safety in Welding and Cutting**.

	<p>ELECTRIC SHOCK from welding electrode or wiring can kill.</p>
	<p>HIGH FREQUENCY RADIO WAVES can cause interference and sometimes even damage to nearby electronic equipment (such as computers) that are un-protected.</p>
	<p>MAGNETIC FIELDS can affect implanted medical devices. Wearers of pacemakers should keep away until consulting their doctor.</p>
	<p>Welding can cause FIRE OR EXPLOSIONS. Do not weld near FLAMMABLE or EXPLOSIVE MATERIALS. Have the proper type of extinguisher in the work area.</p>
	<p>WEAR NON-FLAMMABLE protective clothing, footwear and head gear at all times.</p>
	<p>HOT PARTS can cause severe burns. Do not touch recently welded components. Avoid touching torch components and welding fixtures soon after welding.</p>
	<p>ARC RAYS can burn the eyes and skin. The welding arc emits ultra-violet (UV) radiation and the molten weld gives off infra-red. Both can burn eyes and skin if unprotected. Suitable eye and skin protection must be worn.</p>
	<p>BUILD UP OF GAS can injure or kill. Weld materials can emit toxic fumes during welding. WELD ONLY IN AREAS WITH ADEQUATE VENTILATION.</p>
	<p>FUMES AND GASES can be hazardous. Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health. DO NOT weld in enclosed areas without proper ventilation or respirators.</p>

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	<p>MOVING PARTS - Keep hands and fingers clear of fans, gears, rotors, wire feed, rotation and AVC mechanisms</p>
	<p>WARNING: AMI factory training is essential for all Welding Operators and Maintenance Technicians who operate AMI equipment.</p>
	<p>WELDING WIRE and ELECTRODES are sharp and can cause injury.</p>
	<p>MOVING PARTS may cause crush or pinch points.</p>
	<p>WARNING: Disconnect the input power to the machine before opening or servicing. Discharge all circuits that store high voltage such as capacitor packs. Only AUTHORIZED and QUALIFIED service personnel should open this equipment.</p>

2.0 SPECIFICATIONS

These specifications pertain the to Model 205 power supply only. For weldheads, refer to the specification sheet of each particular model. For non-AMI supplied equipment such as gas tanks and regulators, refer to the original manufacturer's documentation.

The Model 205 is a mobile system that is intended be hand carried. The supporting equipment such as weldheads, water coolers, gas regulators, remote controls and extension cables can also be hand carried. Items such as gas tanks and welding fixtures should be moved with appropriate equipment and safety precautions. Gas tanks should be securely anchored to prevent toppling over.

2.1 ELECTRICAL

INPUT POWER DETAIL

The Model 205 can operate on the following Auto Adjusting for Single Phase AC input:

Input Power Single-Phase AC	Rated Welding Output	Welding Amperage Range	Max OCV DC (Up)	Rated Peak Starting Voltage (Up)	Amperes Input At Rated Load Output, 50/60Hz, Single-Phase	KVA @ Duty Cycle	KW
115 Volts TIG 20A	100A @ 14.0 Volts DC, 100% Duty Cycle	5 - 150A	90V 12-16	15 KV	18.4	2.1	2.1
	150A @ 16.0 Volts DC, 30% Duty Cycle	5 - 150A	90V 12-16	15 KV	28	3.4	3.1
230 Volts TIG 20A	100A @ 14.0 Volts DC, 100% Duty Cycle	5 - 150A	90V 12-16	15 KV	8.3	2	1.9
	150A @ 16.0 Volts DC, 30% Duty Cycle	5 - 150A	90V 12-16	15 KV	14.2	3.2	3.1



Input power must be grounded.

OUTPUT POWER

Straight polarity, constant current DC regulation intended for GTAW welding only. Static characteristic of all power supplies is flat.

5 to 150 amperes DC using 100 to 120 VAC input.

5 to 150 amperes DC using 200 to 240 VAC input.

CIRCUIT BREAKER – ON/OFF, two pole, 20 Ampere at 250 VAC.

DUTY CYCLE – determined by the AC input voltage and the required output current. The Model 205 system has an internal thermal sensor that will limit operation should the temperature exceed the safe operating parameters.

2.2 ELECTRICAL SERVICE GUIDE

FUNCTION	RANGE
INPUT VOLTAGE	115/230
INPUT AMPERES AT RATED OUTPUT	13.1
MAX RECOMMENDED STD FUSE RATING IN AMPERES <ul style="list-style-type: none">• CIRCUIT BREAKER, TIME DELAY• NORMAL OPERATING	15 20
MIN INPUT CONDUCTOR SIZE IN AWG	14
MAX RECOMMENDED INPUT CONDUCTOR LENGTH IN FEET (METERS)	91 (28)
MIN GROUNDING CONDUCTOR SIZE IN AWG	14

2.3 PHYSICAL DIMENSIONS

POWER SUPPLY HEIGHT	18" (457mm)
POWER SUPPLY WIDTH	19" (483mm)
POWER SUPPLY DEPTH	14" (356mm)
POWER SUPPLY WEIGHT	51 lbs (22 kg)

2.4 PROGRAMMABLE AND OPERATIONAL FUNCTIONS

SINGLE ENTRY FUNCTIONS

FUNCTION	RANGE
PREPURGE	5.0 – 999.0 seconds
POSTPURGE	5.0 – 999.0 seconds
UPSLOPE	0.0 – 99.9 seconds
START LEVEL	5.0 – 150.0 amps
DOWNSLOPE	00.0 – 99.9 seconds
LEVEL ADVANCE	TIME / POSITION
TRAVEL START DELAY	00.0 – 99.9 seconds
TRAVEL DIRECTION	CW / CCW

MULTI-LEVEL FUNCTIONS

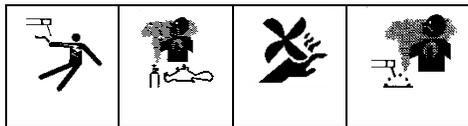
The following functions can be programmed at each level to change value during a given weld sequence.

FUNCTION	RANGE
LEVEL POSITION	0 – 9999 degrees
LEVEL DEGREES	0 – 9999 degrees
SLOPE DEGREES	0 – 9999 degrees
TIME	0.1 – 999.9 seconds
SLOPE TIME	0.0 – 999.9 seconds
PRIMARY AMPS *	5.0 – 150.0 amps
BACKGROUND AMPS	5.0 – 150.0 amps
PRIMARY TRAVEL	As defined by Weldhead **
BACKGROUND TRAVEL	As defined by Weldhead **
PRIMARY PULSE	0.01 – 9.99 seconds
BACKGROUND PULSE	0.01 – 9.99 seconds
PULSE MODE	ON / OFF
TRAVEL MODE	ON / STEP / CONT

* For single level schedules the PRIMARY AMPS function is replaced by START AMPS and END AMPS functions

** TRAVEL functions are in 0.01 RPM increments

3.0 INITIAL SETUP



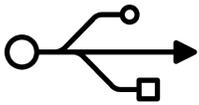
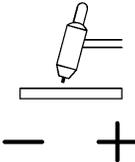
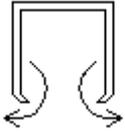
This manual is intended to assist users of this equipment in set up and basic operation. It is NOT INTENDED AS A SUBSTITUTE FOR FACTORY TRAINING.

3.1 SYSTEM SYMBOLS

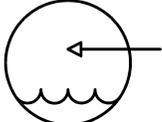
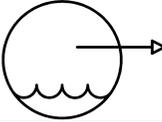
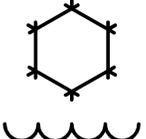
The following symbols are present on the Model 205 version 13B050100-02 Revision NC and up:

	<p>WARNING: Read this manual! This document contains information that could help prevent injury or damage to the equipment.</p>
	<p>115/230 VAC INPUT - AC mains input, 100-240 volts AC, 50/60 Hz.</p>
	<p>ON OFF - On/Off switch (circuit breaker).</p>
	<p>ARC GAS INPUT - input for the arc shielding gas. An external regulator and flow indicator must be used.</p>

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	<p>USB - USB port. Devices should not be left plugged in while welding.</p>
	<p>REMOTE - Remote control connection</p>
	<p>GROUND(+) ELECTRODE(-) - weldhead ground and electrode connections.</p>
	<p>ARC GAS OUTPUT - output for the arc shielding gas connection.</p>
	<p>WELDHEAD CONTROL - weldhead motor control. Intended for AMI and EXEL weldheads only.</p>

The optional water cooler M205-CW is marked with the following symbols:

	<p>WATER RETURN - cooling water input.</p>
	<p>WATER OUT - cooling water output.</p>
	<p>Cooling liquid tank fill opening.</p>

3.2 INSPECTION

The Model 205 is shipped with a variety of peripheral equipment such as gas hoses, fittings and cables. An exact list of these items is included with each power supply shipment and should be located prior to setup.

- After unpacking, inspect all items for obvious physical damage and loose parts. If damage is evident, contact a factory representative before using. If water condensation is apparent, dry the unit before using.
- Check all fittings and connectors for proper seating and ensure that all protective boots are in place. If the unit is not properly seated or protected short circuits, poor connections or inert gas leaks could occur.
- Ensure that all cables are routed and protected in such a way that they will not be subject to heat or equipment / personnel traffic. Ensure that the cables **DO NOT** come in contact with **HOT PIPE**.
- For operation the Model 205 must be placed on a flat level surface capable of supporting the weight of the unit, cables, and any other options. The Model 205 can be mounted on top of the optional water cooler provided the installation will not cause the unit to topple over.
- Check the gas and coolant hoses (if used) to ensure that they are not pinched or bent as this will restrict flow.
- Ensure that the Model 205 has adequate air flow and the intakes and exhaust vents are not restricted.
- Ensure that there is bare metal contact between the weldhead components which connect to **GROUND** (clamp inserts, etc.) and the tube to be welded.

3.3 POWER CONNECTION



To avoid severe equipment damage ensure that the Model 205 power supply is connected to the correct input AC power as listed in Section 2.0 Specifications.

The Model 205 can operate on any single phase voltage from 100V AC to 240V AC. Provided the input voltage is within this range, the unit will automatically adjust for the input voltage.

1. The Model 205 is supplied with a 15 foot power cord. A suitable AC line connector matching the input power must be supplied and installed by the user. Color coding of the power cord is as follows:

Green/Yellow:	Equipment grounding conductor
White/Gray:	Grounded circuit conductor, Neutral
Black:	Ungrounded circuit conductor, Line

2. Ensure that the circuit breaker  is in the down or OFF position.
3. Connect the AC line connector to the power cord.



Do not connect the Model 205 to the AC power source until all installation steps are complete

3.4 WELDING GAS CONNECTIONS



The Model 205 is intended for typical GTAW gases ONLY. NEVER CONNECT OXYGEN OR ACETYLENE TO THE MODEL 205.

1. The Arc Gas hose is supplied with the Model 205. This hose is made of material selected specifically for automatic welding. HOSES MADE FROM OTHER MATERIAL ARE NOT RECOMMENDED (especially rubber, nylon, or tygon).
2. This 10 foot (3 meter) hose should be installed from the gas regulator/flow meter (user supplied) to the ARC GAS INPUT fitting  on the Model 205. The hose is supplied with the fittings required to mate with the Model 205 and most domestic (USA) inert gas flow meters.

3. The arc gas is controlled by a solenoid and flow sensor in the Model 205. Attach the input gas line to ARC GAS INPUT fitting  on the Model 205, NOT DIRECTLY TO THE WELDHEAD.
4. Attach the other end of the input gas hose to the gas regulator/flow meter. Fitting it loosely by hand, tighten the nut slightly with a wrench to ensure there are no leaks. DO NOT OVER TIGHTEN. The use of plumbers tape or grease is NOT RECOMMENDED.



The Model 205 arc gas solenoid valve is rated at 50 PSI (345 kPa) maximum pressure, DO NOT EXCEED THIS RATING.

3.5 MODEL 205 TO M8 / M9 WELDHEAD HOOK UP



Always turn the power supply off before making any cable or connection changes to the power supply.

Non-liquid-cooled weldheads (Models 9-250 and 9-500) connect directly to the Model 205. Liquid-cooled weldheads connect to the Model 205 via a short pig-tail or via an adapter cable. If needed an extension cable can be used. The extension cable connects to the Model 205, then to the weldhead for non liquid-cooled weldheads or to the adapter cable for liquid-cooled weldheads.

Pig-tail Connections

1. Connect the ground and electrode brass quick-disconnect fittings on the pig-tail to the mating fittings on the weldhead. Pull the knurled ring on the female fitting back and fully insert the male fitting. These connectors are fully seated when the ring will spring back to its original position. Slide the rubber boots together and secure them in place, being careful not to dislodge the connectors. Male boots should cover the connection first. The boots protect the connectors and prevent shorting to ground.
2. Attach the ground and electrode connectors on the pig-tail to their respective GROUND(+) and ELECTRODE(-) terminals  on the Model 205. Align the keyways, push in and turn clockwise until fully locked.

3. Insert the two coolant line quick-disconnect fittings on the pig-tail into the mating WATER OUT  and WATER RETURN  connectors on the Model 205-CW. These connectors are interchangeable so either connector may be connected to either mating fitting. To prevent accidental disconnection after making the connection, finger-tighten the lock screw on the male connectors.
4. Attach the weldhead control male connector on the weldhead to the WELDHEAD CONTROL connector  on the Model 205. Note the positioning keyway and NEVER FORCE or use tools on the cable connectors. Hand-tighten the connecting ring being careful not to cross-thread the ring.
5. Insert the male gas quick-disconnect fitting on the weldhead to the mating ARC GAS OUTPUT connector  on the Model 205 and hand-tighten the lock screw to prevent accidental disconnection. Slide the rubber boot over the connection.

Adapter Cable Connections

1. Connect the ground and electrode brass quick-disconnect fittings on the adapter cable to the mating fittings on the weldhead. Pull the knurled ring on the female fitting back and fully insert the male fitting. These connectors are fully seated when the ring will spring back to its original position. Slide the rubber boots together and secure them in place, being careful not to dislodge the connectors. Male boots should cover the connection first. The boots protect the connectors and prevent shorting to ground.
2. Attach the weldhead control male connector on the weldhead to the mating weldhead control female connector on the adapter cable. Align the keyways and carefully screw the retaining ring in place. DO NOT use tools and be careful not to cross-thread the fitting. To help prevent damage screw the connector dust caps to each other.
3. Insert the male gas quick-disconnect fitting on the weldhead to the mating female fitting on the adapter cable. Hand-tighten the lock screw to prevent accidental disconnection. Slide the rubber boots over the connection and secure them together.
4. Attach the ground and electrode connectors on the adapter cable to their respective GROUND(+) and ELECTRODE(-) terminals  on the Model 205. Align the keyways, push in and turn clockwise until fully locked.

5. Insert the two coolant line quick-disconnect fittings on the adapter cable into the mating WATER OUT  and WATER RETURN  connectors on the Model 205-CW. These connectors are interchangeable so either connector may be connected to either mating fitting. To prevent accidental disconnection after making the connection, finger-tighten the lock screw on the male connectors.
6. Attach the weldhead control male connector on the adapter cable to the WELDHEAD CONTROL connector  on the Model 205. Note the positioning keyway and NEVER FORCE or use tools on the cable connectors. Hand-tighten the connecting ring being careful not to cross-thread the ring.
7. Insert the male gas quick-disconnect fitting on the adapter cable to the mating ARC GAS OUTPUT connector  on the Model 205 and hand-tighten the lock screw to prevent accidental disconnection. Slide the rubber boot over the connection.

Fig. 1
Hookups for Non-Liquid Cooled Weldheads

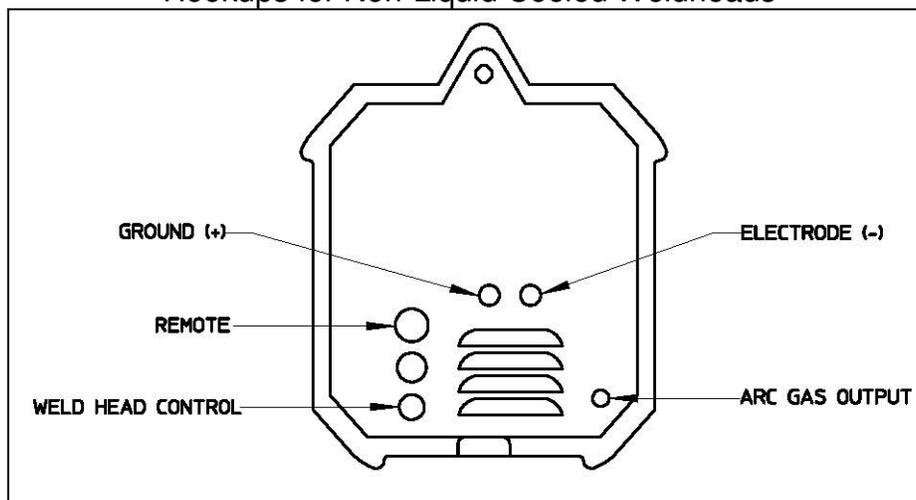
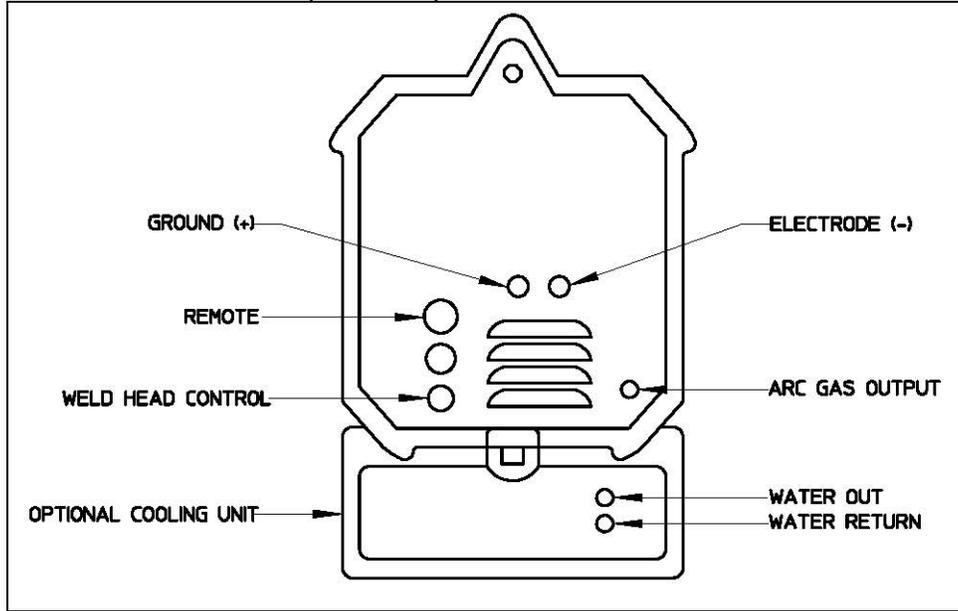


Fig. 2
Hookups for Liquid Cooled Weldheads



3.6 MODEL 205 TO EXEL ROTOR DRIVER HOOK UP



Always turn the power supply off before making any cable or connection changes to the power supply.

The EXEL rotor driver (Model RDR-005) connects directly to the Model 205. The rotor driver has NO connections to the M205-CW Cooling Unit.

1. Attach the ground and electrode connectors on the rotor driver to their respective GROUND(+) and ELECTRODE(-) terminals  on the Model 205. Align the keyways, push in and turn clockwise until fully locked.
2. Attach the weldhead control male connector on the rotor driver to the WELDHEAD CONTROL connector  on the Model 205. Note the positioning keyway and NEVER FORCE or use tools on the cable connectors. Hand-tighten the connecting ring being careful not to cross-thread the ring.
3. Insert the male gas quick-disconnect fitting on the rotor driver to the mating ARC GAS OUTPUT connector  on the Model 205 and hand-tighten the lock screw to prevent accidental disconnection. Slide the rubber boot over the connection.

Note

Note: for installation of the other components of the EXEL weldhead assembly (rotor unit and fixture) see the Exel Welding System Rotor Units and Rotor Driver Operation Manual, P/N 740111.

3.7 MODEL 205 TO M21 WELDHEAD HOOK UP

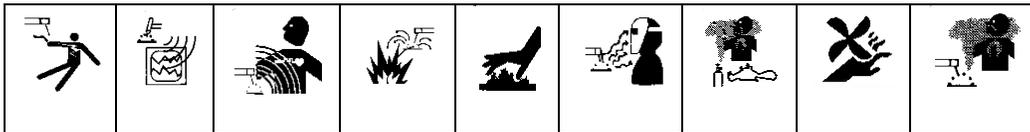


Always turn the power supply off before making any cable or connection changes to the power supply.

Note

Note: for hook up of the M21 weldhead see the Model 21 Weldhead Operation Manual, P/N 740122.

4.0 OPERATION



Operation covers those steps that must be taken to enter a weld schedule and perform a weld.



Ensure that the operator has installed the Model 205 per Section 3.0 and has a good understanding of system functions (Section 4.1).



Ensure that the system is protected against dirt, dust, etc. NEVER GRIND NEAR AN EXPOSED WELDHEAD OR THE MODEL 205.



Protect the system from water and liquid spray. Do not use the system if excessive moisture is present.

4.1 SYSTEM FUNCTIONS

The Model 205 is intended for use with AMI or EXEL orbital welding heads and has functions designed for these weldheads. This section describes what these functions are and may, where needed for clarification, indicate how they are commonly, but not always, used.

- **LIBRARY** - The heart of the Model 205 is its MEMORY. The values of each parameter for a given weld are only programmed one time. After that the Model 205 will store the parameter values by schedule NAME, DIAMETER, WALL thickness, and MATERIAL.

The operator may find a particular weld schedule by scrolling through the library listings or by using the SEARCH feature which can search by DIAMETER, WALL thickness or MATERIAL.

- **WELD SEQUENCE AND LEVELS** – A weld schedule is started by manually initiating Sequence Start. Once the sequence is started, the system operation of functions is fully automatic.

A weld schedule has the ability to change values for most functions as the electrode traverses around the tube. The weld schedule is broken down into LEVELS and each level can contain a change to one or more functions. A weld schedule can contain up to 100 levels. The advance from level to level is automatic and can be programmed by time or degrees.

- **TRAVEL FUNCTION** – The system is equipped with a motor servo controller that provides the power and regulation for rotating the electrode around weld seam. The rotation is programmed in revolutions per minute (RPM) and can be programmed to rotate continuously or stepped (synchronized with current pulsation).
- **PULSATION** – The system can rapidly change or pulse back and forth between two different values of current and two different values of rotation travel. The HIGH value is designated as the PRIMARY value and the LOW value is designated as the BACKGROUND value. The pulsation rate is programmed by setting both the PRIMARY and BACKGROUND PULSE timers.
- **FAULT STATUS** – The system monitors arc gas flow, arc volts and power supply temperature. If any of these functions fall outside certain limits the system will alert the operator and weld schedule will be halted (See Section 5.3).
- **GAS FUNCTIONS** – As stated, the Model 205 is intended for the GTAW process. This process requires a welding gas (usually inert) for operation. The Model 205 is equipped with a gas solenoid and input/output connectors for the control of the welding gas. Flow rates are not controlled by the power supply and must be set via an external flow meter.
- **PRINT FUNCTIONS** – A thermal printer is built into the Model 205. It will print the library of weld schedules as well as the programmed values and associated data of a specific weld schedule.
- **WELD DATA RECORDING** – The system has the capability of recording data from the weld. This data is feedback data from both the Travel and Current servos and is recorded every 0.1 second. This data is saved to the hard drive of the Model 205 as a Weld Data Record. The name of the Weld Data Record is a concatenation of the Power Supply & Power Supply Serial Number & Weld Schedule Name & Weld ID. This record can be exported to a USB memory stick to be loaded to a PC then viewed / printed.

Note

A Weld Data Record can ONLY be created in Weld Mode and ONLY when Weld Data Recording is enabled.

4.2 INITIAL POWER ON



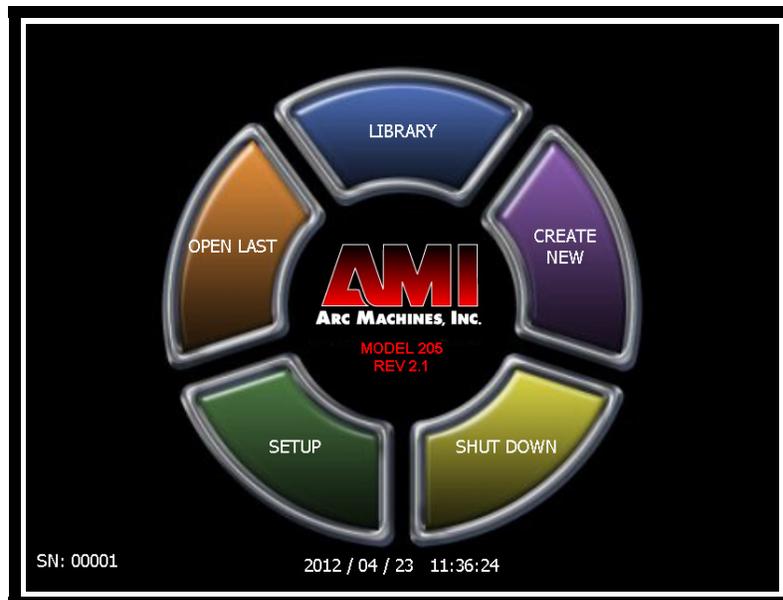
Before proceeding with POWER ON it is EXTREMELY important to have a basic understanding of SYSTEM FUNCTIONS. Read Section 4.1 - System Functions before proceeding.

1. Before connecting or energizing the AC power verify that all input power set up requirements of Section 3.0 have been complied with.
2. Connect the AC power cable to the AC source and to the 115/230 VAC INPUT connector  on the Model 205. Move the circuit breaker to the ON position.
3. If the Model 205-CW is installed connect the AC cord to 110 or 220 VAC, single phase power. Set the ON/OFF switch to the ON position.

Note

The Model 205-CW contains a flow sensor. The green lamp indicates that there is sufficient flow. If this lamp goes out either the water level is too low or there is a blockage in the line. Add coolant or clear the blockage before continuing to weld.

4. Boot-up and display the HOME screen takes approximately one minute.



4.3 SET-UP FUNCTIONS

The SET UP screen is used for the initial configuration of the power supply. Use this screen to set up the following functions:

Date/Time setting
Password setting
Language selection
Language Update

DATE/TIME SETTING

1. From the HOME screen press SETUP.
2. From the SETUP screen select each Date and Time field to be changed. Enter the new date and time data on the 10-key pad, then press ENTER. When all data has been entered press the SET DATE/TIME button to set the new date and time.



PASSWORD SETTING

The Model 205 can be set up to require a password entry to use the machine. Your unit is shipped to you with no password requirement.

1. **OPERATOR:** An Operator may load and run any weld schedule but may not create, change, delete, or copy a weld schedule.

2. **SUPERVISOR:** A Supervisor may load and run any weld schedule. In addition, a Supervisor may create, change, delete, or copy a weld schedule.
3. **PROGRAMMER:** A Programmer has the same level of access as a Supervisor and in addition can delete or change the Operator, Supervisor and Programmer passwords, perform all Setup functions, calibrate the Model 205 and create, change or delete languages.

TO SETUP A PASSWORD:

1. From the Home screen press SETUP.
2. From the ENTER PASSWORD screen enter the Programmer password.
3. Press CHANGE OPERATOR, SUPERVISOR, or PROGRAMMER PASSWORD.
4. Enter the old password into the OLD PASSWORD field (or leave blank if no password is assigned).
5. Enter the password into the NEW PASSWORD field.
6. Re-enter the password into the CONFIRM PASSWORD field.
7. Press ENTER.
8. Re-boot the system – from the Home screen press SHUTDOWN then press YES on the Shut Windows screen. Wait for the screen to go blank before turning off the circuit breaker.

TO DELETE OR CHANGE A PASSWORD:

1. From the HOME screen press SETUP.
2. From the ENTER PASSWORD screen enter the Programmer password.
3. You may now select which password to delete or change by pressing CHANGE OPERATOR PASSWORD, CHANGE SUPERVISOR PASSWORD or CHANGE PROGRAMMER PASSWORD and follow the steps above. Setting blank fields in the NEW PASSWORD and CONFIRM NEW PASSWORD fields will delete the password.

TO RESTORE A PASSWORD:

1. If you have lost or forgotten your password contact AMI Service Department to obtain a one-day password. This will restore access to the unit and allow you to set up new passwords.

LANGUAGE SELECTION

The Model 205 contains multiple pre-programmed languages. In addition, you may customize a language or create a new language by replacing existing button names or data entry titles with your own description.

Selecting one of the pre-programmed languages:

1. From the HOME screen press SETUP.
2. From the SETUP screen press LANGUAGE.
3. Select any of the languages displayed.

LANGUAGE UPDATE

Customizing a pre-programmed language or creating a language from a pre-programmed language:

1. Insert a USB memory stick in the Model 205 USB port.
2. From the HOME screen press SETUP.
3. From the SETUP screen press ADD LANGUAGE.
4. Select a language from the list that the new language will be based on.
5. Enter the word to be changed in the textbox and press FIND (note: the search is case sensitive)
6. Type the new word in the FOREIGN LANGUAGE column.
7. When you are finished making your changes you may overwrite the existing language and keep the original name or enter a new name in the LANGUAGE NAME field.
8. Press SAVE.

Changing a language Font, Style and Size:

The words in some languages require more letters than others. To fit additional characters into all fields the font, style and/or size may need to be changed.

1. From the HOME screen press SETUP.
2. From the SETUP screen press ADD LANGUAGE.
3. Select the language to be changed.
4. Press CHANGE FONT.
5. Select a different Font, Style and/or Size and press OK.
6. Press SAVE to overwrite this language or enter a new name in the LANGUAGE NAME textbox and press SAVE.

Deleting a language:

1. From the HOME screen press SETUP.
2. From the SETUP screen press ADD LANGUAGE.
3. Select the language to be deleted from the list and press DELETE.

Copy a language to External Memory:

1. Insert a USB memory stick in the Model 205 USB port.
2. From the HOME screen press SETUP.
3. From the SETUP screen press ADD LANGUAGE.
4. Select a language from the LANGUAGE LIST
5. From the ADD LANGUAGE screen press COPY LANGUAGE TO EXT MEMORY.
6. When the Windows® Browse for Folder screen displays, select the external memory location: D.
7. Press OK.

Add a language from External Memory:

1. Insert a USB memory stick in the Model 205 USB port.
2. From the HOME screen press SETUP.
3. From the SETUP screen press ADD LANGUAGE.
4. From the ADD LANGUAGE screen press ADD LANGUAGE FROM EXT MEMORY.
5. When the Windows® Open screen displays, select the language file in the external memory to be added (*.lgv file).
6. Press OK.



When adding a language from external memory the language *MUST* be formatted for the Model 205 software otherwise the screens will be corrupted when this language is selected.

CURRENT LANGUAGE	FOREIGN LANGUAGE
AMPS (A)	
VOLTS (V)	
TRAVEL (RPM)	
SCHEDULE NAME ALREADY EXISTS.	
TUBE DIAMETER CAN NOT BE ZERO.	
ENTERED TUBE DIAMETER IS NOT WITHIN THE RECOMMENDED SIZES FOR THIS WELD HEAD	
WALL CAN NOT BE ZERO.	
MATERIAL CAN NOT BE EMPTY.	

LANGUAGE LIST

- CHINESE(SIMP)
- CHINESE(TRA)
- DUTCH
- FRENCH
- GERMAN
- ITALIAN
- JAPANESE
- KOREAN
- POLISH

ADD LANGUAGE FROM EXT. MEMORY

COPY LANGUAGE TO EXT. MEMORY

LANGUAGE NAME

FIND

COPY CURRENT TO FOREIGN

CHANGE FONT

DELETE

SAVE

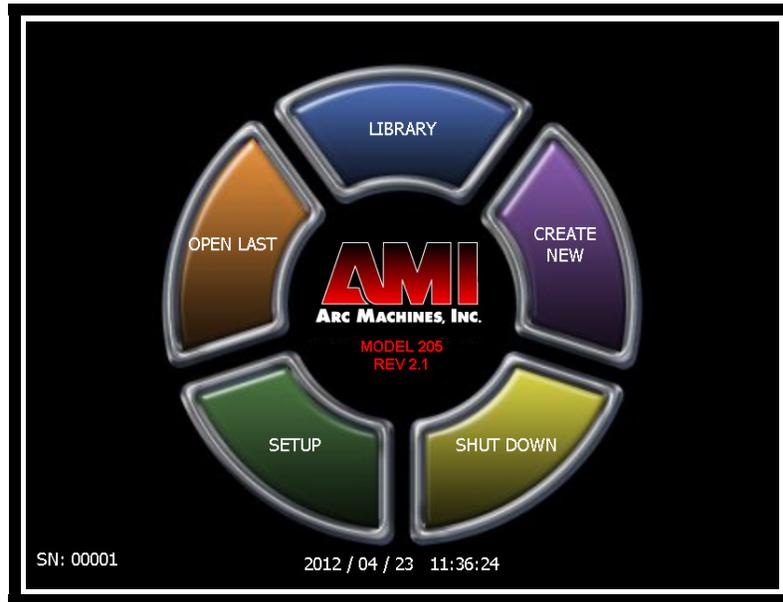
CLOSE

*USE USB KEYBOARD TO ENTER TEXT IN THIS SCREEN

4.4 OPENING THE LAST WELD SCHEDULE

Skip to Step 4.8 if no weld schedules are stored in the library.

1. From the HOME screen, press OPEN LAST.



4.5 SELECTING A WELD SCHEDULE FROM THE LIBRARY

Skip to Step 4.8 if no weld schedules are stored in the library.

1. From the HOME screen, press LIBRARY.
2. Weld schedules will be listed from newest to oldest. Select a weld schedule then press LOAD.



Note

Use the UP or DOWN arrows to find additional weld schedules.

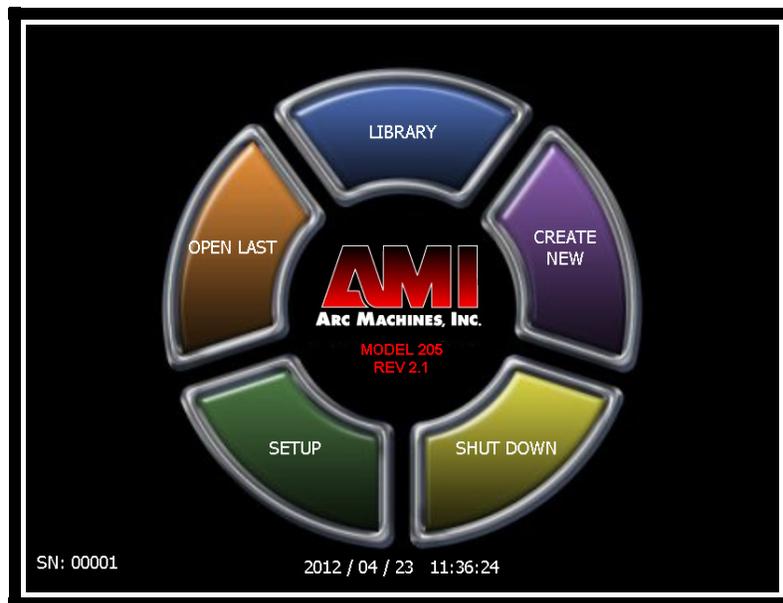
Note

You may search for and segregate weld schedules by DIAMETER, WALL or MATERIAL. Select one or more of these categories from the 3 drop-down lists, select the weld schedule, then press LOAD.

4.6 MODIFY A WELD SCHEDULE

Skip to Step 4.8 if no weld schedules are stored in the library.

1. From the HOME screen press OPEN LAST (to modify the last weld schedule loaded) or LIBRARY to select and load a weld schedule from the Library.



2. From the RUN screen press SCHEDULE.



3. The first parameters displayed are the SINGLE ENTRY parameters. The MULTI-LEVEL parameters and ASSOCIATED DATA parameters are accessed by using the NEXT button on each screen.

Single Entry Parameters:



Multi-Level Parameters:

PARAMETER	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TIME	10.1	10.1	10.1	10.1
SLOPE TIME	0.0	0.0	0.0	
PRIMARY AMPS	75.0	70.0	65.0	60.0
BACKGND AMPS	22.5	22.5	22.5	22.5
PRIMARY TRAVEL	1.06	1.06	1.06	1.06
BACKGND TRAVEL				
PRIMARY PULSE	0.20	0.20	0.20	0.20
BACKGND PULSE	0.20	0.20	0.20	0.20
PULSE MODE	ON	ON	ON	ON
TRAVEL MODE	CONT	CONT	CONT	CONT

Buttons: RUN, BACK, NEXT, PRINT, +1%, PRIMARY, -1%, ADD LEVEL, DELETE LEVEL, HELP, MULTI LEVEL

Associated Data Parameters:

Buttons: RUN, BACK, NEXT, INCH, PRINT

NAME: 75A CONTINUOUS

WELD HEAD: 9-2500

TUBE

DIAMETER	1.500
WALL	0.065
MATERIAL	SS
COMP1	
COMP2	

GAS

ARC GAS	ARGON
ARC FLOW	25.000 CFH
BACK UP TYPE	
BACK UP FLOW	0.000 CFH

ELECTRODE

TYPE	CERIATED
DIAMETER	0.062
LENGTH	1.390
TIP DIAMETER	0.030
GRIND ANGLE	17.00
ARC GAP	0.050
PART NUMBER	TC06-1390-03
START POSITION	ALL

JOB

CUSTOMER NAME	SAS
JOB NUMBER	123456
ASSY. NUMBER	13579-101

NOTES: _____

ASSOCIATED DATA

Button: HELP

- Select each field to be modified and enter the text or value via the on-screen alphanumeric keyboard or 10-key pad, then press the RETURN or ENTER key. The changes will automatically be saved.

Note

If the +1% or -1% button is pressed on the Multi Level screen the Primary Amps will be incremented or decremented by this percentage. This is for the purpose of 'tweaking' the current to improve the quality of the weld.

Note

Associated Data parameters are information only. Electrode Diameter, Arc Gap, Electrode Length and Part Number are calculated for M8 and M9 weldheads. For EXEL and M21 weldheads these fields are populated from the following look-up tables:

Rotor Unit	Rotor OD	Arc Gap	Tube OD	Electrode Length	Electrode Diameter	P/N
RTU-004	0.796	0.035	0.125	0.301	0.040	TC04-0301-02
			0.250	0.238	0.040	TC04-0238-02
RTU-008SL	1.696	0.035	0.125	0.750	0.040	TC04-0750-02
			0.250	0.688	0.040	TC04-0688-02
			0.375	0.626	0.040	TC04-0626-02
			0.500	0.563	0.040	TC04-0563-02
RTU-008	1.814	0.035	0.125	0.809	0.040	TC04-0809-02
			0.250	0.746	0.040	TC04-0746-02
			0.375	0.685	0.040	TC04-0685-02
			0.500	0.622	0.040	TC04-0622-02
			0.625	0.560	0.040	TC04-0560-02
RTU-016SL	2.628	0.040	0.500	1.024	0.062	TC06-1024-02
			0.750	0.899	0.062	TC06-0899-02
			1.000	0.772	0.062	TC06-0772-02
RTU-032	3.75	0.045	0.500	1.580	0.062	TC06-1580-02
			0.750	1.456	0.062	TC06-1456-02
			1.000	1.331	0.062	TC06-1331-02
			1.500	1.081	0.062	TC06-1081-02
			2.000	0.830	0.062	TC06-0830-02

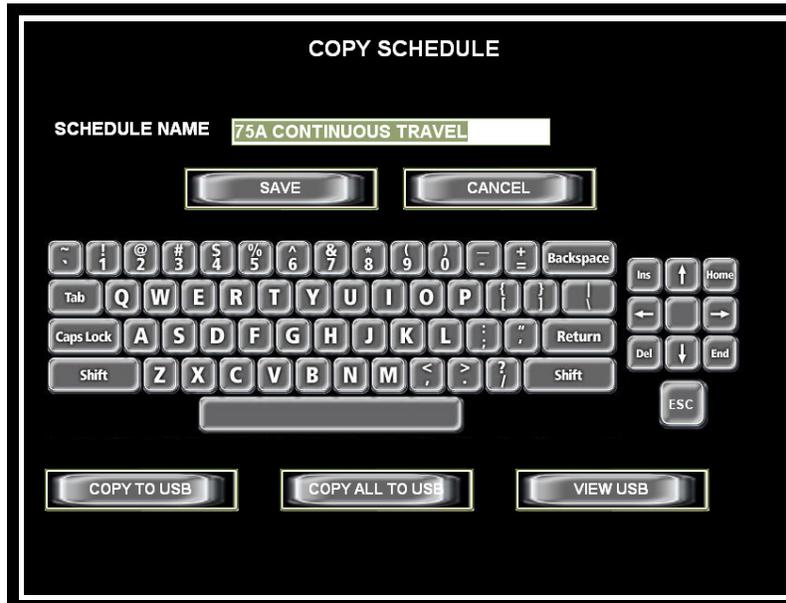
Weld Head	Tube OD	Electrode Length	Wall	Electrode Diameter	Tip Diameter	P/N
M21-500	1/8"	0.395	0.020	0.040	0.005	TC04-0395-005
	1/4 "	0.325	0.035	0.040	0.005	TC04-0325-005
	3/8"	0.260	0.035	0.040	0.005	TC04-0260-005
	1/2"	0.195	0.049	0.040	0.005	TC04-0195-005
M21-1000	1/4"	0.706	0.035	0.062	0.005	TC06-0706-005
	3/8"	0.643	0.035	0.062	0.005	TC06-0643-005
	1/2"	0.573	0.049	0.062	0.005	TC06-0573-005
	3/4"	0.440	0.065	0.062	0.01	TC06-0440-01
	1"	0.315	0.065	0.062	0.01	TC06-0315-01

4.7 COPY A WELD SCHEDULE

The Model 205 has the ability to make a copy of a weld schedule and save it under a new name in the Model 205 Library.

You may also copy one or all weld schedules stored in the Model 205 Library and save them to a USB Memory stick, or copy one or all weld schedules on a USB memory stick and save them to the Model 205 Library.

- **Copy a weld schedule in the Model 205 Library**
 1. From the HOME screen press LIBRARY then select the weld schedule to be copied.
 2. Press COPY. Enter a new schedule name and press either SAVE or RETURN. The new schedule will be saved to the Library.



- **View Weld Schedules Stored On a USB Stick**

1. Insert a USB memory stick into the USB port  on the Model 205.
2. From the HOME screen press LIBRARY.
3. From LIBRARY press VIEW USB.



- **Copy one or all weld schedules in the Model205 Library and save to a USB memory stick.**

1. Insert a USB memory stick into the USB port  on the Model 205.
2. From the HOME screen press LIBRARY.
3. Select a weld schedule to be copied and press COPY.
4. For copying one weld schedule to a USB stick press COPY TO USB. For copying ALL weld schedules to a USB stick, press COPY ALL TO USB.

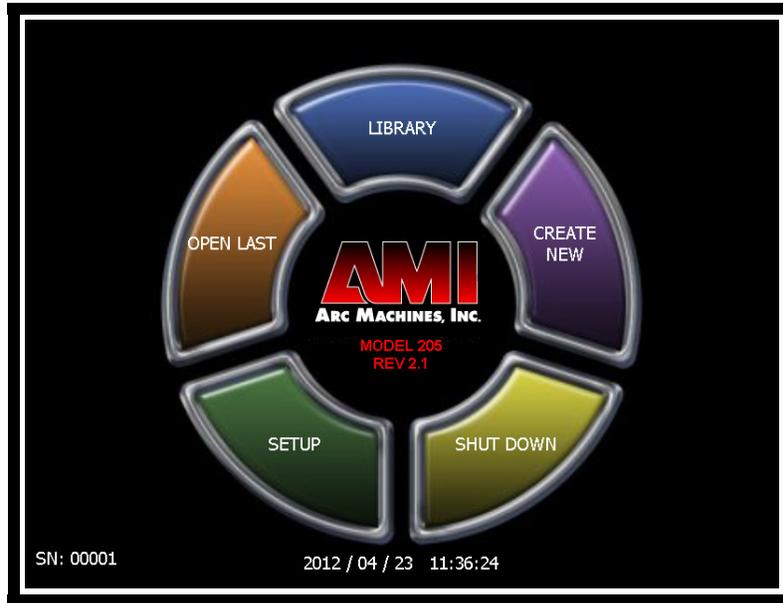
- **Copy one or all weld schedules from a USB memory stick to the Model 205 Library**
 1. Insert a USB memory stick into the USB port  on the Model 205.
 2. From the HOME screen press LIBRARY, then press VIEW USB.
 3. Select the weld schedule to be copied and press COPY TO M205. If copying all weld schedules press COPY ALL TO M205.



4.8 CREATE A WELD SCHEDULE

The Model 205 provides two versions of manual weld schedule creation: Manual Multi level and Manual S³ (Single Level Sloped) and four versions of Automatic weld schedule generation: Auto Continuous Travel, Auto Stepped Travel, Auto Tack, and Auto S³.

1. From the HOME screen press CREATE NEW.



2. Enter the Weld Schedule NAME.
3. Enter the DIAMETER, WALL and, MATERIAL.
4. Press the WELDHEAD MODEL field and select the weldhead that you will be using.

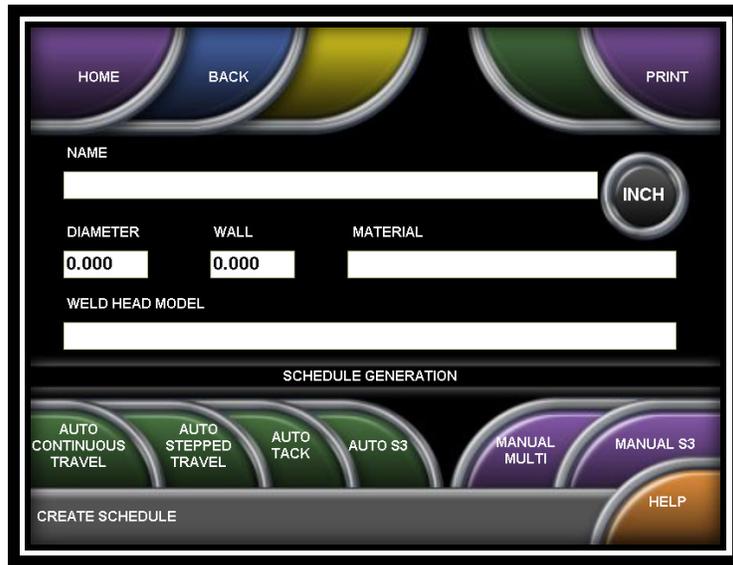
Note

Use the ENTER key (on the displayed 10-key pad) or the RETURN key (on the displayed keyboard) to SAVE each entry before making an entry into the next field.

Note

The Name, Diameter, Wall and Material will be displayed in the Library. The Diameter, Wall, and Weldhead Model will be used for establishing welding parameters for Automatic Weld Schedule generation.

5. Toggle the INCH key to select inches or millimeters to represent the size of the tube to be welded.



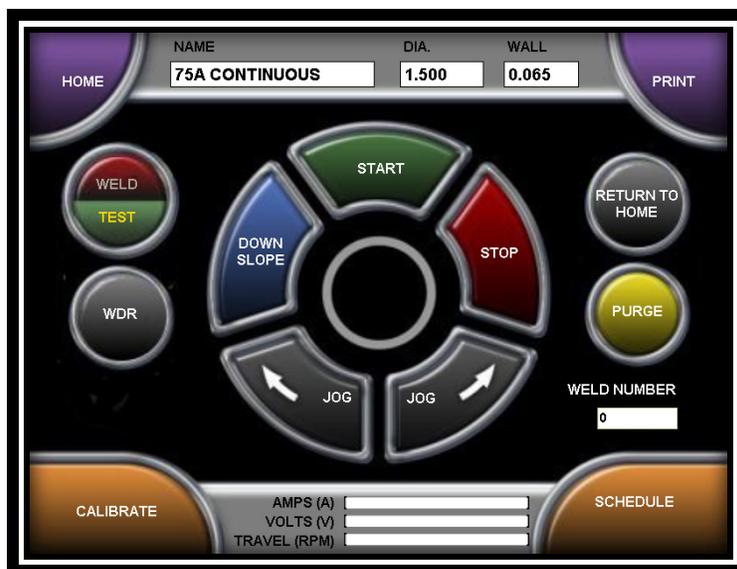
6. The welding parameters may now be entered manually by selecting either MANUAL MULTI or MANUAL S³, or a weld schedule may be automatically generated by selecting AUTO CONTINUOUS TRAVEL, AUTO STEPPED TRAVEL, AUTO TACK, or AUTO S³.
- **Manual Multi** – this option allows the entry of a multi-level weld schedule. You may program up to (and not including) 100 levels. Electrode rotation can be either continuous or stepped (synchronized with current pulsation).
 - **Manual S³** – this program allows the entry of an S³ weld schedule. An S³ schedule is a single-level program that ramps the current down over the course of the weld rather than stepping it down via multiple levels. This ramping is programmed by selecting a starting amps (START AMPS), a background amps, and an ending amps (END AMPS). Over the course of the weld the amps will ramp down to the value programmed into END AMPS while pulsing between the ramping down starting amps value and the background amps value.
 - **Auto Continuous Travel** – this version of automatic programming will create a 4-level weld schedule with electrode rotation in the continuous mode.
 - **Auto Stepped Travel** – this version of programming will create a 4-level weld schedule with electrode rotation in the stepped mode. In this case the electrode rotation will be synchronized with the current pulsation. The most common method used rotates the electrode during the background amps and stops the electrode rotation during the primary amps.

- **Auto S³** – this version of automatic programming will generate a single-level program that continually ramps the current down over the course of the weld. This ramping is established by programming a starting amps (START AMPS) and an ending amps (END AMPS).
- **Auto-Tack** – this type of auto programming creates a weld schedule for tacking. You may specify the approximate depth of tack penetration, the number of tacks, and a tacking sequence – sequential or balanced.

4.9 WELDHEAD CALIBRATION

Any time a different weldhead or weld schedule is selected the weldhead must be calibrated to that weldhead and schedule.

1. Load the weld schedule from the Library. When the RUN screen opens press CALIBRATE.



2. Check to be sure that it is safe to run the weldhead rotation and press START.
3. The calibration process rotates the electrode twice around at two different speeds. At the completion of calibration the screen will display CALIBRATION COMPLETED. If the calibration fails, an adjustment to the weldhead calibration potentiometer is required.

If an adjustment to the weldhead's calibration potentiometer is required the screen will display

CALIBRATION FAILED – TURN TRIM POT CCW – TRY AGAIN
or
CALIBRATION FAILED – TURN TRIM POT CW – TRY AGAIN

- Using the screw driver supplied with the weldhead turn the weldhead's potentiometer a few turns in the recommended direction and re-run the calibration procedure (Steps 1 & 2). Continue these steps until the screen displays CALIBRATION COMPLETED.

Note

M21 weldheads do NOT have a calibration potentiometer.



To prevent possible injury do not open the weldhead until the calibration process is complete.

4.10 PERFORMING A WELD

- Install the weldhead per Section 3.5 and the specification sheet for the weldhead.
- From the HOME screen press the LIBRARY key, select a weld schedule and press LOAD, or use the OPEN LAST key to access the last schedule used.
- Before performing the weld calibrate the weldhead to the schedule being used per Section 4.9. This is required when a different schedule and/or weldhead is used.
- Install the correct tungsten and the material to be welded into the weldhead as described in the weldhead manual.
- Turn on the gas source at the regulator/flow meter. Press the PURGE button and set the required flow rate for the weldhead being used. Continue manual purge until all lines are filled with the gas and all moisture and impurities have been removed. Turn the purge OFF by pressing the PURGE button again.

Note

The font on the PURGE button turns red when it is activated.

Note

If for any reason the Operator leaves the Weld screen the manual purge will stop.

6. The Model 205 features a WELD/TEST button. In the TEST mode the unit will allow for electrode rotation but will not strike an arc. The WELD or TEST font on the button turns yellow to indicate which mode the system is set to.
7. When you are ready to start welding press the WELD/TEST button to put the power supply in WELD mode.



8. Press START to initiate the weld. The center of the RUN screen displays a count-down of each weld sequence.



Note

For M21 weldheads refer to the Model 21 Weldhead Operation Manual on how to initiate and stop a weld sequence.

9. Once the operator manually presses the START button the following events will occur automatically:

- **EVENT 1:** PREPURGE - welding gas will start to flow and continue to flow for the entire weld sequence from the gas source through the power supply to the weldhead. Complete gas coverage should be obtained before the arc is struck. How long it flows before the arc is struck is called the PREPURGE time. Minimum programmable time is 5 seconds. Refer to the on line HELP for minimum recommended PREPURGE time for each weldhead.
- **EVENT 2:** ARC START - when PREPURGE time is complete the gas will continue to flow and a high frequency pulse will be generated to establish an arc between the electrode and the weld joint.

Note

When the system initiates it waits for 0.5 second for either an arc start or arc fault response.

- **EVENT 3:** UPSLOPE - when an UPSLOPE is programmed the arc will be initiated at the programmed START LEVEL amps. As soon as the arc is established the amps will ramp up to the programmed Level 1 PRIMARY AMPS value. When an UPSLOPE is not programmed, the arc will be initiated at the Level 1 PRIMARY AMPS value.

Once the arc is established and PULSE MODE programmed to ON the weld current will pulse between the PRIMARY and BACKGROUND amp values. The amount of time it remains at these values is determined by the PRIMARY and BACKGROUND PULSE times.

In most cases, rotation of the arc should not begin until full penetration of the weld has been achieved. Once the arc is established the TRAVEL START DELAY time will begin to count. When this time has counted down, the weld schedule will advance to Level 1 and begin rotating the electrode at the Level 1 programmed travel speed for the Level 1 programmed number of seconds or degrees of rotation.

After the TRAVEL START DELAY time is complete, the electrode will begin to travel in one of the 3 programmable PULSE MODES:

OFF - Prevent rotation from occurring.

CONTINUOUS - Rotates the electrode continuously at the PRIMARY TRAVEL speed, regardless of PULSE MODE.

STEP - Rotates the electrode, alternating between the PRIMARY TRAVEL speed and the BACKGROUND TRAVEL speed. This function is synchronized to the PRIMARY PULSE time and the BACKGROUND PULSE time.

Note

The electrode rotation direction is a Single Entry function and cannot be programmed to change direction during a weld.

- **EVENT 4:** LEVEL 1 and FOLLOW-ON LEVELS - at the end of TRAVEL START DELAY the program will automatically advance to Level 1 and then to follow-on levels.

If programmed by DEGREES the electrode will rotate to position programmed in each level before advancing to the next level. If programmed by TIME the electrode will rotate for the amount of time programmed in each level.

- **EVENT 5:** DOWNSLOPE – at the end of the last level over the course of the programmed DOWNSLOPE time both primary and background amps will ramp down while continuing to pulse until the arc is extinguished.
- **EVENT 6:** POSTPURGE – once the arc is extinguished the POSTPURGE time begins counting down. During this time the arc gas continues to flow into the weldhead.
- **EVENT 7:** RETURN TO HOME – at the end of the POSTPURGE the gas will shut off, the weldhead rotor will return to its HOME position, and the Weld Number will update.
- **COMPLETE:** after the rotor has returned to its HOME position the welded tube can be removed from the weldhead.
- Press the PRINT button to print the Weld Schedule if desired.



DO NOT attempt to open the weldhead to remove the weld until the rotor has returned to its home position.

4.11 WELD DATA RECORDING

- Setup and Enable Weld Data Recording
 1. Press WDR to open the Weld Data Recording screen.

The screenshot shows a software interface for recording weld data. At the top, there is a 'RUN' button. Below it, the 'PROJECT DATA' section is highlighted with a red box. This section contains two sub-sections: 'OPERATOR INFO' and 'LOCATION INFO'. 'OPERATOR INFO' includes fields for 'WELD ID' (VITO 01) and 'USER NAME' (AMUSER). 'LOCATION INFO' includes fields for 'PROJECT INFO' (TESTING123), 'BUILDING' (18-01), 'DRAWING NUMBER' (123456-101), and 'ADDITIONAL INFO' (ARE WE HAVING FUN YET?). Below these is the 'EQUIPMENT INFO' section, which includes fields for 'POWER SUPPLY MODEL NUMBER' (M205), 'POWER SUPPLY SERIAL NUMBER' (1), 'WELD HEAD MODEL NUMBER' (43500), and 'WELD HEAD SERIAL NUMBER' (222). At the bottom, there are three buttons: 'WDR ENABLED' (grey), 'WDR DISABLED' (red), and 'EXPORT WDR FILE' (blue). The text 'WELD DATA RECORDING' is displayed at the very bottom of the screen.

2. Enter data in each of the fields

Note

Power Supply Model Number, Power Supply Serial Number and Weldhead Model Number are already stored in the system so these fields are automatically filled.

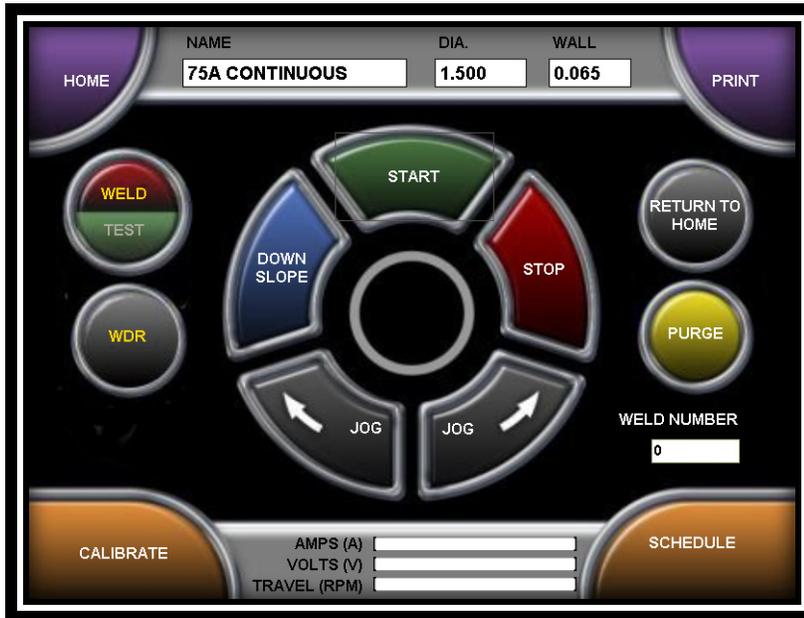
Note

The ONLY required field is Weld ID and it must be unique. If a non-unique value is entered (Weld Camino de las Estrellas ID that has already been used) an error message will be displayed.

3. Press WDR ENABLED to turn on Weld Data Recording.

- **Record Weld Data**

1. Press RUN to return to the Weld screen.
2. Toggle WELD/TEST to WELD.



Note

The font on the WDR button turns **yellow** if Weld Data Recording is enabled AND Weld/Test is set to Weld.

3. Press START to start the weld sequence and the Weld Data Recording

Note

The font on the WDR button turns **red** while the weld data is being recorded.

- **Export Weld Data Record**

1. Insert a USB memory stick into the USB port on the Model 205.
2. Press WDR to return to the Weld Data Recording screen.

3. Press EXPORT WDR FILE to select a WDR file and an export destination.



EXPORT WDR FILE

SOURCE C:\AMI\WDR\W205-1-AUTO S3-VITO 01.wdr

DESTINATION D:\

OK CANCEL

4. Press OK

Note

The OK button will ONLY be enabled when BOTH the Source and Destination fields are filled. The Destination will normally be the D:\ drive which is the USB memory stick.

5. Repeat steps 3 and 4 to export additional WDR files.
6. Remove the USB memory stick and load on a PC to view / print the weld data record(s).

Note

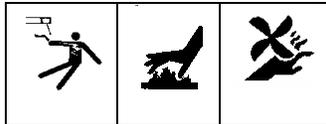
*The exported weld data record(s) will be in *.csv format and can be opened in Microsoft Excel or Notepad.*

5.0 MAINTENANCE AND TROUBLE-SHOOTING



Always disconnect the AC power cable from the line voltage before attempting to work with this welding power supply.

5.1 GENERAL MAINTENANCE



- COOLANT - the water tank in the optional Model 205-CW cooling unit holds approximately 0.75 gallons (2.8 liters) of fluid. Check the fluid level periodically. The use of different weldheads will remove fluid from the tank over a period of time. Fill the tank per instructions in Section 6.1 COOLING UNIT.
- Cleaning exterior and interior surfaces. Prolonged use in dusty shop or outside environments may cause the outside surfaces to accumulate a coating of dirt and dust. Do not use shop air to blow dust particles away from the panels since it is usually too wet. Use a vacuum cleaner with a soft brush. Where a vacuum brush cannot reach use a clean soft paint brush and then vacuum.
- INPUT/OUTPUT PANEL CONNECTIONS - periodic inspection of the Model 205 panel as well as electrode/gas/water return quick-disconnects on all cables should be performed. Damaged, dented or deformed connectors may cause poor or unsafe operation and water or gas leakage. The O-ring inside the weldhead electrode and gas quick-disconnects should be periodically cleaned and re-greased.
- Precautions to follow for storing or handling:

Always keep weldheads in the protective containers they are shipped in or in an optional carrying case until ready for use. Residual coolant should be drained from the weldhead cables to prevent corrosion.

Always keep the protective boots and dust caps on all connectors and fittings until cables are ready to be installed. A major cause of downtime in any automatic welding system is improper care and use of cables.

Take extreme care to avoid dropping the power supply or the weldheads.



Always disconnect the power input cable from the junction box or wall-plug before cleaning.

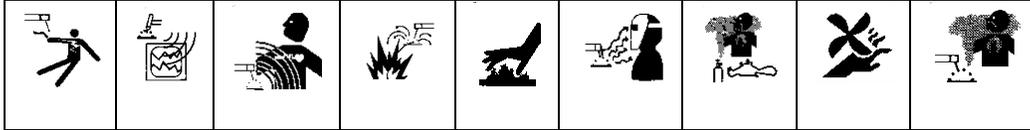


DO NOT USE acid, corrosives or any liquid substance on the Model 205 or any AMI weldhead. When cleaning use only a light solution of isopropyl alcohol on a soft cloth.



DO NOT ADD lubrication such as graphite, oil, or grease to the weldhead or power supply unless it is specified in the operation manual for that equipment.

5.2 CURRENT OUTPUT CALIBRATION



This procedure is intended for calibration/verification of output current by the user. True verification of current output for Quality Control purposes must be performed with a calibrated External Calibration Shunt. This shunt may be obtained from Arc Machines, Inc. (Part Number 13B072511-01).

 ***All personnel attempting to calibrate, trouble-shoot, or repair the Model 205 must be familiar with its operation. They must understand the circuits and have a complete understanding of the controls and their relationships.***

  ***All personnel must be aware of the location of hazardous voltage-carrying conductors, terminals, heat sinks, etc. and must employ safety precautions when working with the Model 205.***

EQUIPMENT REQUIRED

- Digital Multimeter (DMM), minimum 4-digit readout. The meter must have floating inputs (not connected to line or chassis ground) with a minimum of 1 mega ohm input impedance. Battery operated devices are recommend. Suggested: Fluke Model 8060A or equivalent.
- AMI Fusion Weldhead rated for 150 amperes and a pipe or tube that will not melt away with 150 amps applied. As an alternative a manual torch can be set up on a flat plate (refer to Section 5.2.2).
- AMI External Shunt, 1 mV/amp, Part Number 13B072511-01 (optional).
- Argon or other acceptable GTAW gas source.

PROCESS

A weld schedule is required for calibration and will need to be created the first time a calibration is done.

1. Set up a Weldhead rated for 150 amps continuous duty and insert a tube, pipe, or copper rod that can withstand 150 amps of continuous current with no rotation. If these items are not available then use a Hand Torch on a large plate with the torch fixed so it cannot change the gap during calibration.
2. Connect the shunt between the ground connection on the power supply and the ground connection on the weldhead or manual torch. Current is always measured along the return path (Fig. 3).

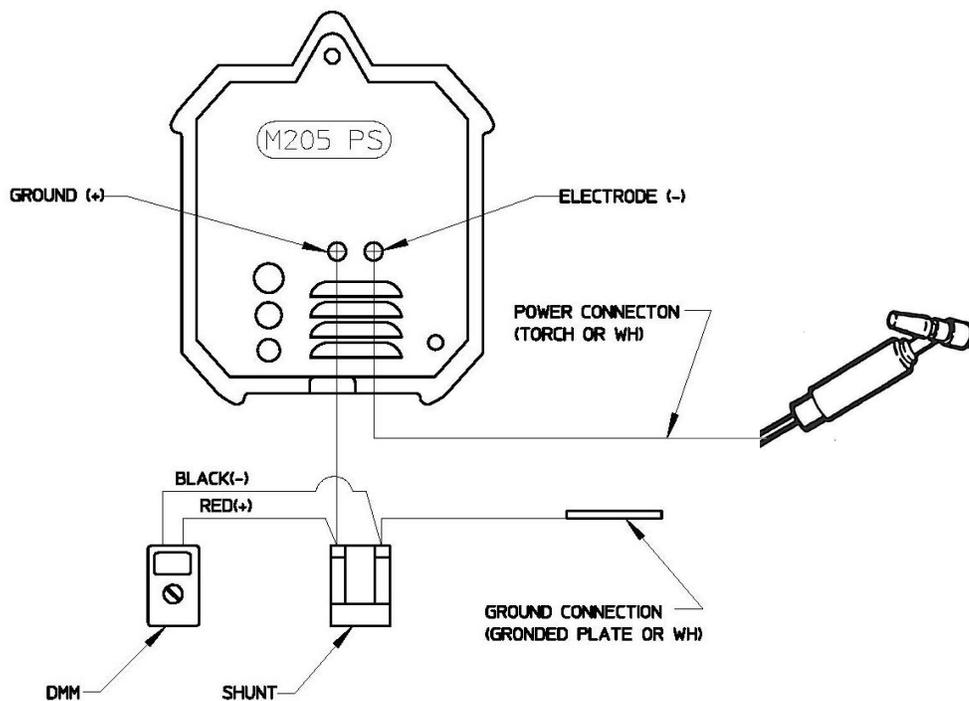
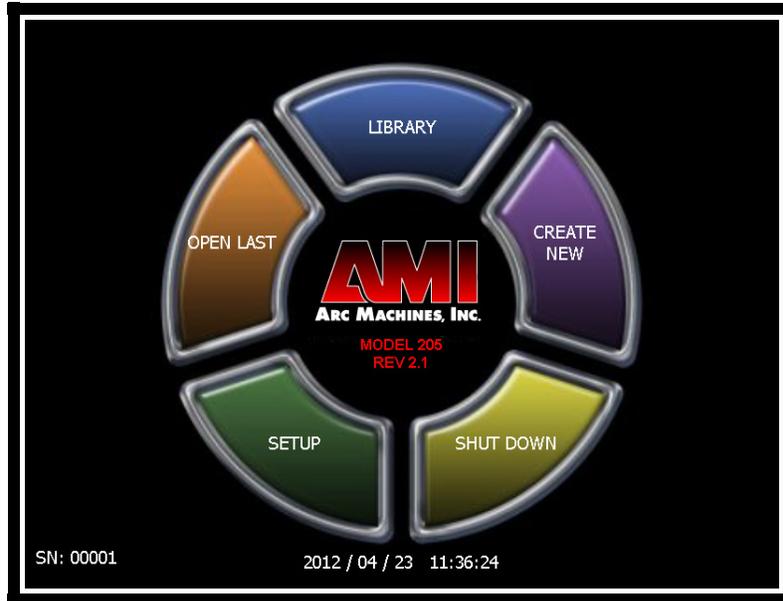


Fig. 3

3. From the HOME screen press SETUP



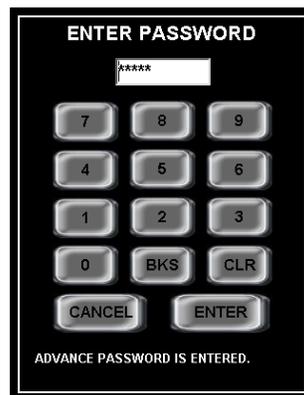
4. From the SETUP screen press ADVANCED.



Note

To prevent unauthorized personnel from accessing the calibration feature a temporary one-day password is required. Contact the AMI Service department for this password. You will need the Power Supply serial number displayed on the HOME screen to obtain this password.

5. Input the one-day password and press ENTER.



6. Setup the Digital Multimeter to read the 200 mVDC scale.
7. Prepare to insert the test probes into the red and black terminals on the shunt.



Any testing or recording instruments connected to any points in the machine or to the welding head may be exposed to extremely high transient voltage at the time the arc starter operates. ENSURE THAT ALL TEST EQUIPMENT IS DISCONNECTED DURING ARC START.



Make sure that when an arc is struck nothing will be overheated or melted.

Note

If an orbital weldhead is used instead of a manual torch you will need to hook up the weldhead arc gas line to the power supply

8. The START button is located in the upper right corner of the screen. Once you have determined it is safe to initiate an arc press START. After the arc is established connect the black and red test probes from the DMM to the shunt (Fig. 3).
9. The weld schedule will remain at each Command level for 15 seconds and advance through all 10 Commands. During this process make note of the DMM mV reading at each Command.
10. At the conclusion of the weld sequence enter each of the DMM readings into the SHUNT column.



11. Press HOME to return to the HOME screen

5.3 TROUBLESHOOTING

The Model 205 has the ability to monitor certain functions. If they are not working correctly a system fault will alert the operator to the problem.

SYSTEM FAULT CORRECTIONS

When a System Fault occurs prior to or during welding it is required for the operator to clear the fault condition before continuing.

Some faults are only temporary and the fault is corrected when the arc goes out. But all faults will cause the FAULT SCREEN to appear and let the operator know why the sequence was stopped.

The following is a general description of the cause of each type of fault and some recommendation for correction. In all cases, when the fault is corrected the operator must press the OK button to close the FAULT SCREEN.

- **TEMPERATURE** - the Model 205 has an internal temperature sensor (thermal switch). If the Power Supply internal temperature rises above the safe limit, a TEMPERATURE fault occurs. This can only occur if there is some type of blockage of air circulation, fan failure, component failure within the Power Supply, or that the system is being operated in ambient air temperatures above or below its rating of 0° C (32° F) and 45° C (104° F) / 95% humidity (non-condensing).

This Fault should only occur during an actual weld sequence. If it occurs when the machine is not welding then a serious internal problem exists. In this case turn the Power Supply OFF and call an AMI Service representative.

- **GAS** - this fault will occur at the beginning of a weld sequence or during a weld sequence. If arc gas flow through the system should stop or fall below 7 CFH, a fault will occur.

Check that the Gas Source is turned on and that adequate gas is available. Check all gas hoses and connections for free flow. This is usually the problem.

If there is no problem with the source or with the hoses and their connections then an internal failure of the flow switch, solenoid or internal hosing is possible. Contact an AMI Service representative.

- **ARC VOLTS LOW** or **STUB OUT** - this fault will only occur when an arc is present and will no longer exist when the arc goes out. If the arc voltage gets too low (below 5 volts) or the electrode should touch the weld puddle an ARC VOLT fault will occur. This creates an ALL STOP condition and does not actuate the RETURN TO HOME function after Postpurge.
- **ARC VOLTS HIGH** - if the arc voltage is too high (above 20 volts) during a weld sequence this fault will occur. It usually occurs if a hole is made in the weld, causing the arc to wander over to the far side of the hole. The most common cause of this is either poor tube fit-up or excessive gas pressure inside the tube causing the weld to blow out and create a hole.
- **BAD START** - if for any reason the Model 205 cannot establish a stable arc at the end of Prepurge the system will display a BAD START fault. There can be several reasons for this to occur. The most common are poor ground or electrode connections, contaminated gas or a contaminated electrode. Another common cause of a BAD START is too short of a Prepurge time. This is especially true when a system or weldhead is being used for the first time in a shift. While it sits unused atmosphere can propagate into the cables. Before performing the first weld of a shift, use the Manual Purge for a minute or two to initially clear the gas lines.

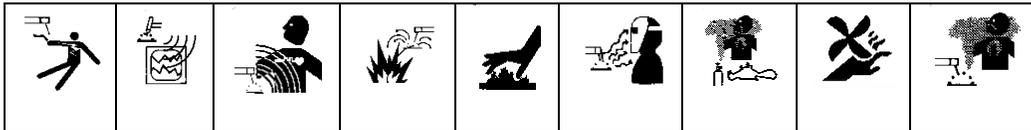
Note

AMI recommends 2% Ceriated welding electrodes. They have proven to be much more effective than 2% Thoriated electrodes for RF transmission and are reported to have longer life than 2% Thoriated Electrodes.

Note

There are no user serviceable components located inside the Model 205. Do not open the unit in an attempt to repair it. Contact Arc Machines if the unit is malfunctioning or suspected of being broken. As such no wiring diagram or internal circuit drawing is provided.

6.0 OPTIONS



The following are installation and operation instructions for Model 205 options. Some options have their own manuals and these are not discussed in this section.

  ***Always turn the power supply OFF before making any cable or connection changes to the Model 205 power supply.***

6.1 COOLING UNIT (Model 205-CW)



SPECIFICATIONS

AC INPUT POWER	90–260 VAC 1 Phase, 4 amps max.
COOLANT CAPACITY	0.75 gallons (2.8 liters)
CIRCULATION	0.5 GPM (2.8 LPM)

PHYSICAL CONSTRUCTION

MATERIAL	Aluminum cabinet/Polyethylene tank
HEIGHT	6.25 inches (159 mm)
WIDTH	19.0 inches (483 mm)
DEPTH	14.0 inches (356 mm)
WEIGHT (with water)	27 lbs (12.3 kg)
WEIGHT (without water)	21.5 lbs (9.8 kg)
PUMP	60 PSI (413 kPa)

INSTALLATION

1. The cooling unit is shipped dry and requires 0.75 gallons (2.8 liters) of either:
 - CLEAN DISTILLED or *DE*-IONIZED water
 - CLEAN DISTILLED or *DE*-IONIZED water and **OPTISHIELD® 'Plus'** (mix per manufacturer's instructions)
 - A 50/50 mixture of ethylene glycol and CLEAN DISTILLED or *DE*-IONIZED water



DO NOT USE automotive antifreeze or STOP-LEAK type antifreeze

2. Before mounting the Model 205-CW Cooling Unit to the Model 205 remove the fill cap  and add the coolant mixture. Replace the fill cap.
3. Place the Model 205 onto the Model 205-CW Cooling Unit and close the latches on each end.
4. For connections to the weldhead see Section 3.5.
5. The Model 205-CW contains a flow sensor. The green lamp indicates that there is sufficient flow. If this lamp goes out either the water level is too low or there is a blockage in the line. Add coolant or clear the blockage before continuing to weld.



DO NOT OPERATE the water cooling unit WITHOUT coolant in the tank OR WITHOUT a water flow path (water OUT to IN through a weldhead).

6.2 OPTIONAL REMOTE PENDANT

- Allows for the remote START/STOP of a weld sequence, JOG of the weldhead rotor, manual gas PURGE, and return to HOME of the weldhead rotor.
- Attach the remote pendant connector to the REMOTE connector  on the Model 205. Note the positioning keyway and NEVER FORCE or use tools on the cable connectors. Hand-tighten the connecting ring being careful not to cross-thread the ring.



Note

The EXEL RDR-005 rotor driver contains a built-in remote pendant which is fully functional with the Model 205.

Note

The remote pendant cannot be connected if an M21 weldhead is being used.

Note

For additional available options, such as extension cables contact Arc Machines, Inc.



Office Locations

<p>Arc Machines, Inc. Headquarters 10500 Orbital Way Pacoima, CA 91331 U.S.A. Tel: 1-818-896-9556 Fax: 1-818-890-3724 sales@arcmachines.com </p>	<p>Arc Machines, Inc. Southwest Office 10650 Haddington Drive Houston, TX 77043 U.S.A. Tel: 1-818-896-9556 Fax: 1-818-890-3724 sales@arcmachines.com </p>	
<p>Arc Machines GmbH Markelsbach 2 D-53804 Much, Germany Tel: +49 / 2245 / 91680 Fax: +49 / 2245 / 916868 sales@arcmachines.de </p>	<p>Arc Machines Switzerland 7 Avenue du Théâtre CH-1005 Lausanne, Switzerland Tel: +41 / 22 / 995 / 0051 Fax: +41 / 22 / 995 / 0059 sales@arcmachines.ch </p>	<p>Arc Machines UK Limited Unit 2 Lamport Court Heartlands Business Park Daventry, NN11 8UF, England Tel: +44 / 1327 / 312787 Fax: +44 / 1327 / 315034 sales@arcmachines.co.uk </p>

www.arcmachines.com www.theglobalweldingcompany.com

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