



OM-891B

121 899B

March 1994

**Processes**

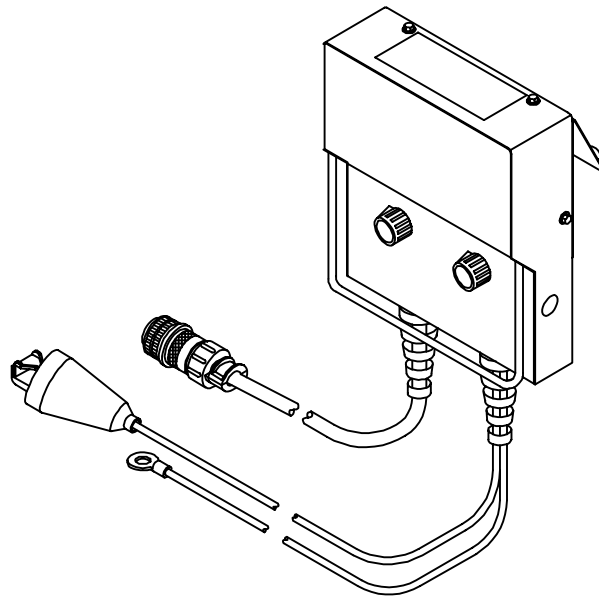


Pulsed MIG (GMAW-P)

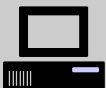
**Description**

Adaptive Synergic Pendant Control

# Optima™ 300 And 450



## OWNER'S MANUAL



Visit our website at  
[www.MillerWelds.com](http://www.MillerWelds.com)

# From Miller to You

*Thank you and congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.



Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at [www.MillerWelds.com](http://www.MillerWelds.com) on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

*Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.*



# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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## 1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ Marks a special safety message.

☞ Means "Note"; not safety related.



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

## 1-2. Arc Welding Hazards

▲ The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.

▲ Only qualified persons should install, operate, maintain, and repair this unit.

▲ During operation, keep everybody, especially children, away.



### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also

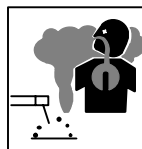
live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.

- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

### SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



### FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



### ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

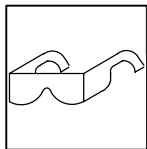
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.



### WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



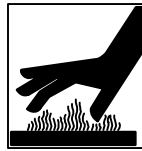
### FLYING METAL can injure eyes.

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



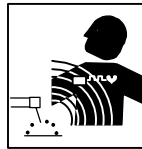
### BUILDUP OF GAS can injure or kill.

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



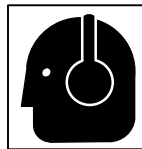
### HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



### MAGNETIC FIELDS can affect pacemakers.

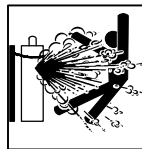
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



### NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



### CYLINDERS can explode if damaged.

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

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

## 1-3. Additional Symbols For Installation, Operation, And Maintenance



### FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.



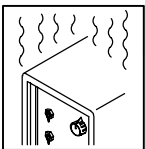
### MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



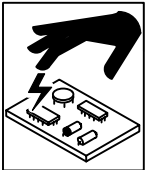
### FALLING UNIT can cause injury.

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



### OVERUSE can cause OVERHEATING

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



### STATIC (ESD) can damage PC boards.

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



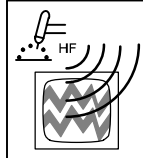
### MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



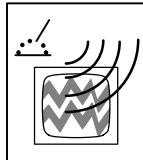
### WELDING WIRE can cause injury.

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



### H.F. RADIATION can cause interference.

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



### ARC WELDING can cause interference.

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

## 1-4. Principal Safety Standards

*Safety in Welding and Cutting*, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

*Safety and Health Standards*, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances*, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting And Welding Processes*, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

## 1-5. EMF Information

### Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

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

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

#### **About Pacemakers:**

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

# SECTION 2 – SPECIFICATIONS

## 2-1. Pendant

| Specification                 | Description  |
|-------------------------------|--|
| Overall Dimensions            | Height: 7-7/8 in (200 mm); Width: 7 in (178 mm); Depth: 2-1/4 in (56 mm)                   |
| Input Power Cord With Plug    | 20 ft (6 m)  |
| Voltage Sensing Leads         | 60 ft (18 m)   |
| Additional Required Equipment | Wire Feeder And Constant Current (CC) Welding Power Source With Needed Interface Circuitry |

# SECTION 3 – INSTALLATION

## NOTE

The Optima 300 can be used with a Maxtron™ 300, XMT® 300 CC/CV, or an ARC PAK™ 350 welding power source. The Optima 450 can be used only with a Maxtron 450.

## NOTE


When using the GMAW-P welding process, it is recommended that 2/0 or 3/0 weld output cables be used.

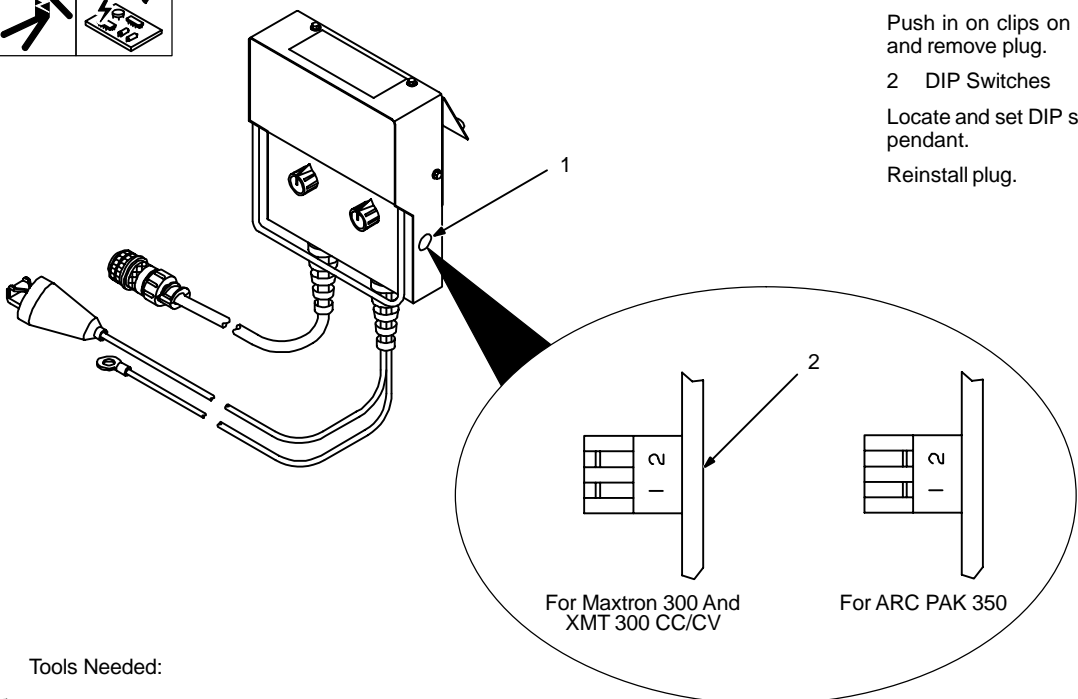
## 3-1. Setting Internal DIP Switches In Optima 300 Model

## NOTE

The Optima 300 is factory set for use with a Maxtron 300 or XMT 300 CC/CV welding power source. This procedure allows the pendant to be used with an ARC PAK 350.

## 3-2. Setting DIP Switches






1 Plug  
Push in on clips on sides of plug, and remove plug.

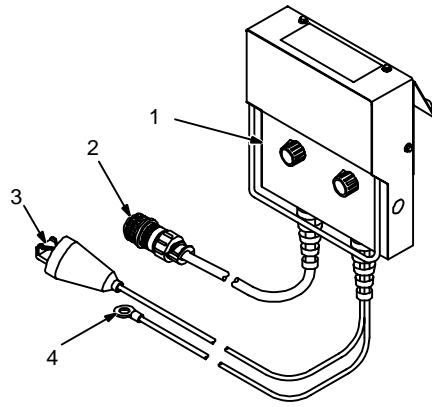
2 DIP Switches  
Locate and set DIP switches inside pendant.  
Reinstall plug.

Tools Needed:

 Nonconductive Only

ST-129 744-A

### 3-3. Pendant Connections



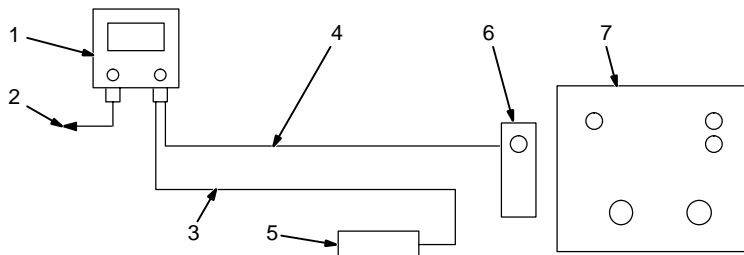
- 1 Optima
  - 2 17-Pin Plug PLG4
- Connect to Remote 17 receptacle on welding power source.

- 3 Voltage Sensing Lead With Clamp (Labeled Work)
- 4 Voltage Sensing Lead With Ring Terminal (Labeled Electrode)

The labels on the voltage sensing leads indicate proper polarity for DC Electrode Positive (Reverse) welding.

Every month check labels, cords, and plugs for damage.

#### Connections To Push-Type Wire Feeder

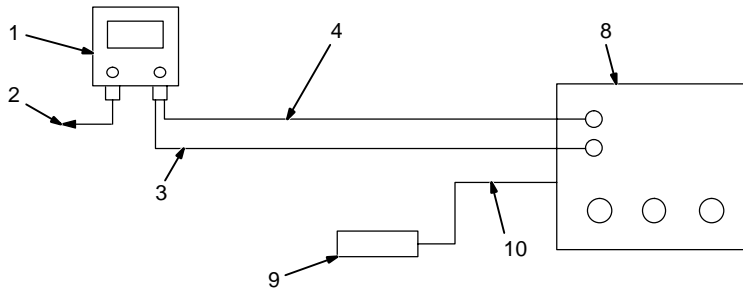


- 5 Work
- Connect voltage sensing lead with clamp to work.

- 6 Wire Drive Assembly
- Connect voltage sensing lead with ring terminal to weld cable terminal.

- 7 Wire Feeder
- Place remote control switch in Standard position, if applicable.

#### Connections To XR A And XR W, And XR-15 And XR-30 (Push-Pull Type) Models Effective With Serial No. JH308298 And Following



Cut ring terminal off voltage sensing lead. Install 1/8 in ring terminal onto lead.

Cut clamp off voltage sensing lead. Strip 1/2 in (13 mm) insulation off end of lead.


- 8 Wire Feeder
- Connect voltage sensing lead with ring terminal to terminal strip 3T terminal B.

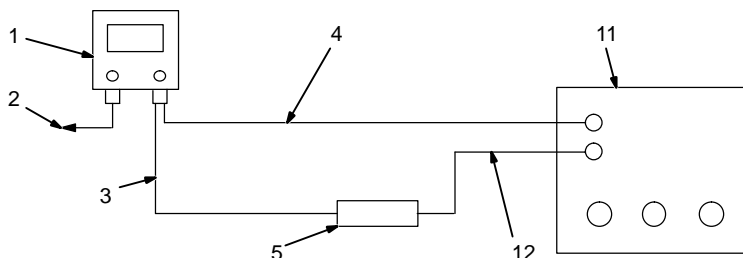
Connect lead with stripped end to terminal strip 3T terminal A.

- 9 Work
- 10 Voltage Sensing Lead From Wire Feeder

Connect to work.

#### Connections To XR-15 And XR-30 (Push-Pull Type) Wire Feeder Models Effective With Serial No. JH247300 Thru JH308297

 *The Optima cannot be used with XR-15 and XR-30 Models prior to Serial No. JH247300.*



Cut ring terminal off voltage sensing lead. Install 1/8 in ring terminal onto lead.

- 11 Wire Feeder
- Connect voltage sensing lead with ring terminal to terminal strip 3T terminal B.

- 12 Voltage Sensing Lead From Wire Feeder (Models With Digital Meter Option Only)

Connect between work and terminal strip 3T terminal A.

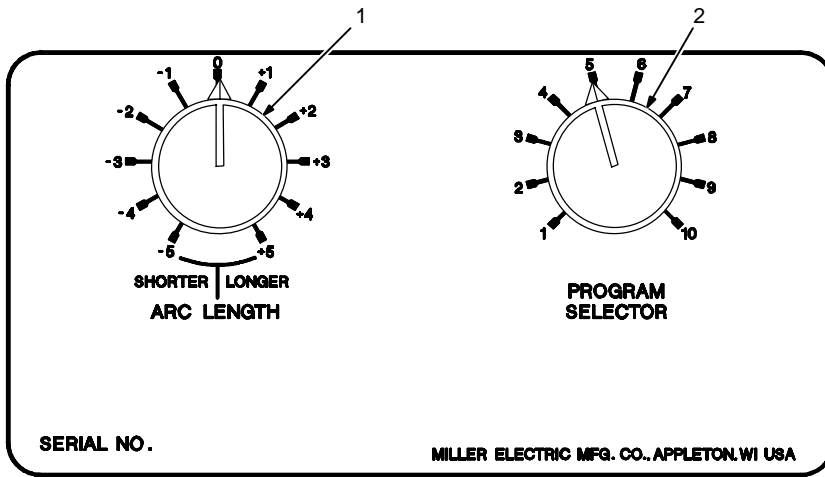


# SECTION 4 – OPERATION

## NOTE

See the GMAW-P (Pulsed MIG) Process Guide for information on the GMAW-P welding process.

### 4-1. Controls



Optima 300 Shown

#### 1 Arc Length Control

Use control to adjust arc length between electrode wire and work. Each weld program selects a different range of values for this control. Adjustment normally needed if wire feed speed or type of weld joint is changed.

Numbers around control are for reference only.

#### 2 Program Selector Switch

Use switch to choose desired welding program (see control nameplate).

Select program to match wire type, wire size, shielding gas, and wire feed speed being used for application.

Ref. ST-127 855-E

### 4-2. Programs

## NOTE

See Synergic statement in warranty at beginning of manual regarding use of the following welding programs.

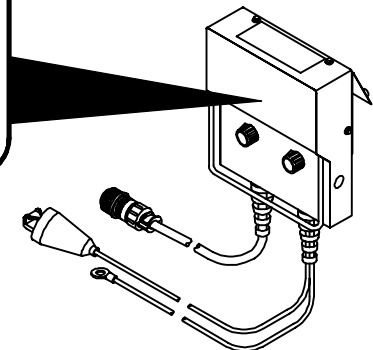
#### A. Optima 300

| Program Number | Wire Type | Wire Size | Shielding              | IPM |     |
|----------------|-----------|-----------|------------------------|-----|-----|
|                |           |           |                        | Min | Max |
| 1              | Nickel    | .035      | Argon                  | 100 | 750 |
| 2              | 5356 AL   | .047      | Argon                  | 120 | 300 |
| 3              | 5356 AL   | .035      | Argon                  | 165 | 650 |
| 4              | 4043AL    | .047      | Argon                  | 150 | 300 |
| 5              | 4043AL    | .035      | Argon                  | 160 | 600 |
| 6              | Steel     | .045      | 95Ar/5 CO <sub>2</sub> | 50  | 400 |
| 7              | Steel     | .035      | 95Ar/5 CO <sub>2</sub> | 90  | 700 |
| 8              | Stainless | .045      | 95Ar/5 CO <sub>2</sub> | 60  | 600 |
| 9              | Stainless | .035      | 95Ar/5 CO <sub>2</sub> | 90  | 800 |
| 10             | Si BR     | .035      | Argon                  | 120 | 300 |

USE WITH WELDING SUPPLY IN CC MODE ONLY.

#### 1 Welding Programs

Alternate gases: 95Ar/5Oxy and 98Ar/2Oxy.



Ref. ST-129 744-A / Ref. ST-127 875-A

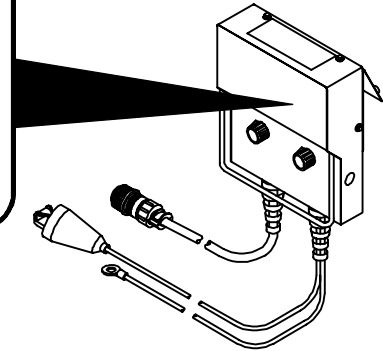
## B. Optima 450

### 1 Welding Programs

Alternate gases: 95Ar/5Oxy and 95Ar/5CO<sub>2</sub>.

| Program Number | Wire Type | Wire Size | Shielding   | IPM |     |
|----------------|-----------|-----------|-------------|-----|-----|
|                |           |           |             | Min | Max |
| 1              | 4043AL    | .062      | Argon       | 90  | 230 |
| 2              | 4043AL    | .047      | Argon       | 180 | 320 |
| 3              | 5356 AL   | .062      | Argon       | 130 | 400 |
| 4              | 309L      | .035      | 98Ar/2 Oxy* | 150 | 700 |
| 5              | 309L      | .045      | 98Ar/2 Oxy* | 90  | 500 |
| 6              | Steel     | .035      | 98Ar/2 Oxy* | 100 | 650 |
| 7              | Steel     | .052      | 98Ar/2 Oxy* | 80  | 450 |
| 8              | Steel     | .045      | 98Ar/2 Oxy* | 80  | 500 |
| 9              | 5356 AL   | .047      | Argon       | 150 | 450 |

USE WITH WELDING SUPPLY IN CC/TIG MODE ONLY.  
\* REFER TO OWNERS MANUAL FOR ALTERNATIVE GASES



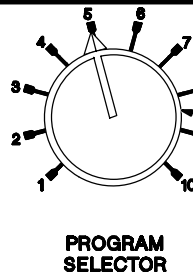
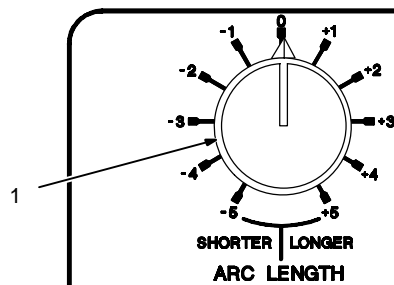
Ref. ST-129 744-A / Ref. ST-152 450-A

## 4-3. Equipment Settings

### NOTE

The ARC PAK 350 does not require special control or switch settings when used with an Optima.

## A. Optima Settings (Both Models)



### 1 Arc Length Control

Begin welding with control at mid-range; adjust to desired arc length.

### 2 Program Selector Switch

Select desired program.

SERIAL NO.

MILLER ELECTRIC MFG. CO., APPLETON, WI USA

Optima 300 Shown

Ref. ST-127 855-E

## B. XMT 300 CC/CV Settings

Welding Power Source  
Switch Settings

CC CV

A/V

14 PANEL

17

14 ON

17

OUTPUT (CONTACTOR)

1

CC • ARC FORCE (DIG) /  
CV • INDUCTANCE

Set switches as shown.

1 Arc Control/ Inductance Control

Set at minimum.

Ref. ST-163 420

## C. Maxtron 300 Settings

Welding Power Source  
Switch Settings

CC CV

A/V

14 PANEL

17

17 ON

OUTPUT (CONTACTOR)

1

CC • ARC CONTROL  
CV • INDUCTANCE

Set switches as shown.

1 Arc Control/ Inductance Control

Set at minimum.

Ref. ST-130 056-B

## E. Maxtron 450 Settings

Welding Power Source  
Switch Settings

Set switches as shown.  
1 Arc Control/Inductance Control  
Set at minimum.

Ref. ST-154 197

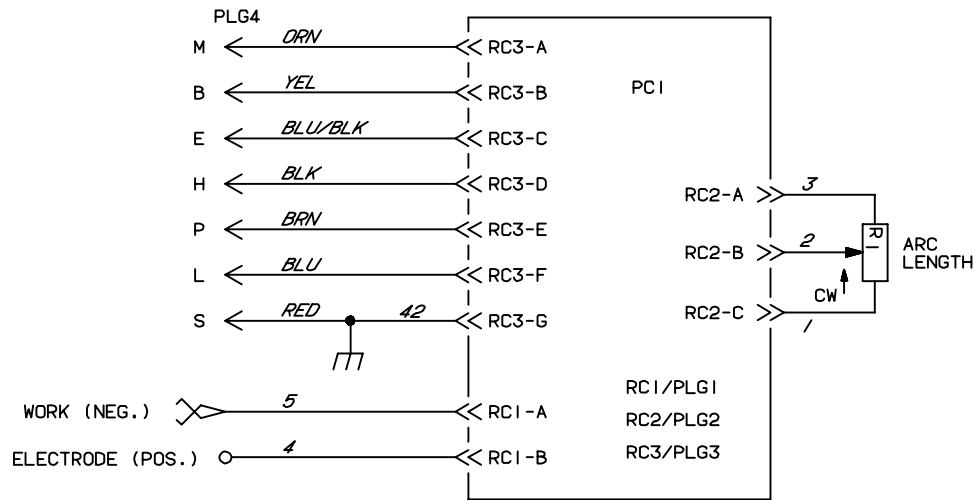
# SECTION 5 – TROUBLESHOOTING

## 5-1. Welding Trouble



| Trouble                                       | Remedy  |
|---|---|
| No weld output.                               | Be sure welding power source Power switch is On.  |
|   | Check welding gun and/or wire feeder if applicable.   |
| No control of weld output.                    | Check welding power source control settings (see Section 4-3).  |
|   | If applicable, be sure voltage sensing leads are connected properly (see Section 3-3).                        |
|   | Be sure plug PLG4 is securely connected to Remote 17 receptacle on welding power source.                      |
|   | Check pendant cord and replace if needed.   |
| Pendant does not work.                        | Check pendant potentiometer and switch.   |
|   | Have Factory Authorized Service station check circuit board PC1.  |
| Erratic weld; incorrect weld characteristics. | Check pendant settings (see Section 4-1).   |
|   | Check wire feed speed at wire feeder for workpiece and program selected.                                      |
|   | If applicable, be sure voltage sensing lead is connected to clean, bare metal at workpiece (see Section 3-3). |

# SECTION 6 – ELECTRICAL DIAGRAM

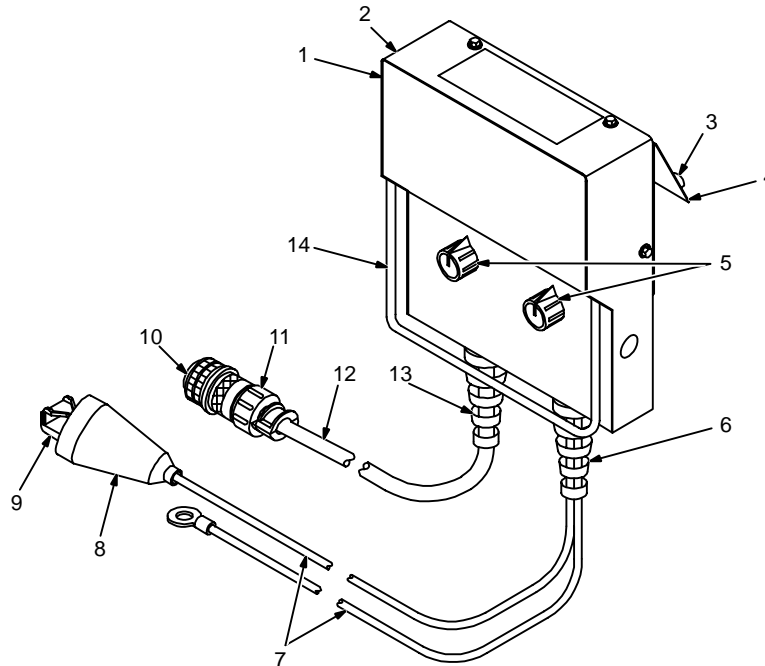


SA-141 214

Figure 6-1. Circuit Diagram For Both Models

# SECTION 7 – PARTS LIST

☞ Hardware is common and not available unless listed.



Ref. ST-129 744-A

Figure 7-1. Main Assembly

| Item No. | Dia. Mkgs. | Part No. | Description  | Quantity |
|----------|------------|----------|--|----------|
| 1        |            | 134 892  | CASE SECTION, front/ends                                     | 1        |
| 2        |            | 126 931  | WRAPPER  | 1        |
| 3        |            | 019 663  | MOUNT, nprn 15/16 OD x 3/8                                   | 2        |
| 4        |            | 150 209  | BRACKET, mtg pendant   | 1        |
| 5        |            | 097 922  | KNOB, pointer  | 2        |
|          | PC1        | 123 700  | CIRCUIT CARD, remote pendant (standard model)                | 1        |
|          | PC1        | 160 654  | CIRCUIT CARD, pulse control (450 model)                      | 1        |
|          |            | 073 756  | STAND-OFF, No. 6-32 x .625 lg                                | 2        |
|          |            | 126 689  | STAND-OFF, No. 6-32 x 1.500 lg                               | 2        |
|          | R1         | 035 897  | POTENTIOMETER, C std slot 1/T 2W 1K ohm                      | 1        |
|          |            | 123 831  | STRIP, fbr .015 x 1.000 x 1.000                              | 1        |
| 6        |            | 123 531  | STRAIN RELIEF, cable flexible .231-.394 cable                | 1        |
|          |            | 135 194  | WASHER, flat rbr .718 ID x 1.000 OD x .031thk                | 1        |
| 7        |            | 600 399  | WIRE, strd 14ga 600V 105c (order by ft)                      | 60ft     |
| 8        |            | 601 226  | INSULATOR, vinyl clamp univ 25A                              | 1        |
| 9        |            | 601 228  | CLAMP, univ 25A  | 1        |
| 10       | PLG4       | 097 866  | CONNECTOR, circ 17 pin plug Amphenol MS-3106A-20-29P         | 1        |
| 11       |            | 073 296  | CONNECTOR, circ clamp str rlf sz 20-22 Amphenol 97-3057-12-6 | 1        |
| 12       |            | 135 304  | CABLE, port No. 18 8/c (order by ft)                         | 20ft     |
| 13       |            | 134 900  | STRAIN RELIEF, cable flexible .270-.480 cable                | 1        |
|          |            | 135 736  | WASHER, flat rbr .812 ID x 1.125 OD x .031thk                | 1        |
| 14       |            | 126 932  | GUARD, front   | 1        |
|          | PLG1       | 135 557  | CONNECTOR & SOCKETS, (consisting of)                         | 1        |
|          |            | 079 747  | CONNECTOR, rect skt 24-18ga Amp 350980-1                     | 2        |
|          | PLG2       | 079 796  | CONNECTOR, rect 3skt plug Amp 640250-3                       | 1        |
|          |            | 079 747  | CONNECTOR, rect skt 24-18ga Amp 350980-1                     | 3        |
|          | PLG3       | 135 558  | CONNECTOR & SOCKETS, (consisting of)                         | 1        |
|          |            | 079 747  | CONNECTOR, rect skt 24-18ga Amp 350980-1                     | 7        |
|          |            | 150 210  | PANEL, rear  | 1        |
|          |            | 057 359  | BLANK, snap-in nyl .375mtg hole                              | 1        |
|          |            |          | NAMEPLATE, (order by model and serial number)                | 1        |

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

# TRUE BLUE® WARRANTY

Effective January 1, 2000

(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

## Warranty Questions?

Call  
1-800-4-A-MILLER  
for your local  
Miller distributor.

Your distributor also gives  
you ...

### Service

You always get the fast,  
reliable response you  
need. Most replacement  
parts can be in your  
hands in 24 hours.

### Support

Need fast answers to the  
tough welding questions?  
Contact your distributor.  
The expertise of the  
distributor and Miller is  
there to help you, every  
step of the way.

**LIMITED WARRANTY** – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
  - \* Original main power rectifiers
  - \* Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
  - \* Transformer/Rectifier Power Sources
  - \* Plasma Arc Cutting Power Sources
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Inverter Power Supplies
  - \* Intelligig
  - \* Engine Driven Welding Generators  
**(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
  - \* DS-2 Wire Feeder
  - \* Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
  - \* Process Controllers
  - \* Positioners and Controllers
  - \* Automatic Motion Devices
  - \* RFCS Foot Controls
  - \* Induction Heating Power Sources
  - \* Water Coolant Systems
  - \* HF Units
  - \* Grids
  - \* Maxstar 140
  - \* Spot Welders
  - \* Load Banks
  - \* Miller Cyclomatic Equipment
  - \* Running Gear/Trailers
  - \* Plasma Cutting Torches (except APT & SAF Models)
  - \* Field Options  
**(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)**
4. 6 Months — Batteries
5. 90 Days — Parts
  - \* MIG Guns/TIG Torches
  - \* Induction Heating Coils and Blankets

- \* APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- \* Remote Controls
- \* Accessory Kits
- \* Replacement Parts (No labor)
- \* Spoolmate 185 & Spoolmate 250
- \* Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.





# Owner's Record

Please complete and retain with your personal records.

---

Model Name Serial/Style Number

---

Purchase Date (Date which equipment was delivered to original customer.)

---

Distributor

---

Address

---

City

---

State Zip

---



## For Service

**Call 1-800-4-A-Miller or see our website at [www.MillerWelds.com](http://www.MillerWelds.com) to locate a DISTRIBUTOR or SERVICE AGENCY near you.**

Always provide Model Name and Serial/Style Number.

---

|                               |  |
|-------------------------------|--|
| Contact your Distributor for: | Welding Supplies and Consumables<br>Options and Accessories<br>Personal Safety Equipment<br>Service and Repair<br>Replacement Parts<br>Training (Schools, Videos, Books)<br>Technical Manuals (Servicing Information and Parts)<br>Circuit Diagrams<br>Welding Process Handbooks |
|-------------------------------|--|

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|                                     |  |
|-------------------------------------|--|
| Contact the Delivering Carrier for: | File a claim for loss or damage during shipment. |
|-------------------------------------|--|

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

### Miller Electric Mfg. Co.

An Illinois Tool Works Company  
1635 West Spencer Street  
Appleton, WI 54914 USA

### International Headquarters—USA

USA Phone: 920-735-4505 Auto-Attended  
USA & Canada FAX: 920-735-4134  
International FAX: 920-735-4125

### European Headquarters – United Kingdom

Phone: 44 (0) 1204-593493  
FAX: 44 (0) 1204-598066

[www.MillerWelds.com](http://www.MillerWelds.com)

