

UltraCleaner

Welding Torch Cleaner



OWNER'S MANUAL

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SECTION 1—SAFETY PRECAUTIONS

Before installation or operation of the UltraCleaner torch cleaner, please read and understand all safety precautions listed below. Failure to follow these instructions may result in personal injury or damage to the equipment.

- Only qualified persons should install, operate, maintain and repair this unit.
- Do not remove or deface warning and instruction labels from the unit.
- Ensure that all equipment in the area is disabled and locked out before setting up, adjusting or conducting any work.
- Ensure that electrical and pneumatic power to the unit is off before setting up, adjusting, or conducting any work.
- Check that electrical and pneumatic connections comply with the codes applicable to your country and state.
- Keep hands away from the unit while it is in operation. Never put your hands or any body part into the cleaning solution when the cleaner is on.
- Use only recommended fluid. Never use flammable or acidic cleaning fluids.
- The cleaning solution may become hot. Use caution when handling fluid.
- For additional safety information, please refer to the following publications:

ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING
American Welding Society, 550 LeJeune Rd. P.O. Box 351040, Miami, FL 33126

ANSI STANDARD, *SAFETY FOR ROBOTS AND ROBOT SYSTEMS*
American National Standards Institute, 1430 Broadway, New York, NY 10018

NFPA STANDARD 70. NATIONAL ELECTRIC CODE
National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

OSHA 29 CFR 1910, SAFETY AND HEALTH STANDARDS
Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

SECTION 2—INTRODUCTION

During welding, spatter accumulates on the shielding nozzle and consumables (contact tip, diffuser). If this spatter is not removed, it will accumulate until the shielding gas is disrupted causing inadequate gas coverage and porosity in the weld seam.

The UltraCleaner helps remove and prevent the build up of spatter.

How it works:

The robot moves the torch into the tank filled with anti-spatter fluid and activates the Ultrasonic generator which makes the Piezo transducers vibrate the tank at a high frequency. The vibrating waves spread throughout the liquid in the tank. When they reach the surface of the weld consumables, they form compression and decompression waves that create micro-bubbles (cavitation), which implode. This phenomenon triggers a mechanical action that breaks the bond of the weld spatter at the molecular level. This breaks the bond of the spatter from the nozzle as well as the gas diffuser and tip. It also cools down all the components. The robot then removes the torch from the tank and a blast of air is pulsed through the torch and out the gas diffuser. This further removes any loose spatter and excessive fluid. The nozzle, tip and diffuser are cleaned, cooled and ready to continue welding.

This process has many advantages over conventional nozzle reamers:

- Cools, cleans and extends consumable life
- Non-contact and no moving parts
- Cleans all types and sizes of nozzles
- Automatic fluid dispensing
- Limit switch activated or robotic I/O controlled
- Eliminates programming nozzle to reamer blade
- Shop air is not required for operation
- Uses standard 120VAC power

The fluid level in the tank is automatically maintained with a peristaltic pump and float switch. The pump pumps the fluid from standard anti-spatter containers. There is a shelf on the optional stand that the container can be placed on.

SECTION 3 - SPECIFICATIONS

Power:

Input Voltage:	120VAC
Input Amperage:	3 Amps
Frequency:	50/60HZ
Fuse Size:	5 Amps
Transducer Power:	300 Watts Peak
Power Cord Length:	25 ft. (7.5 m)

Overall Dimensions:

Height:	15" (38 cm)
Width:	9" (22.8 cm)
Length:	10" (25.4 cm)
Weight:	18.5 lb (6.4 kg)

Tank Dimensions:

Volume:	1/2 gal. (1.89 L)
Depth:	5" (12.7 cm)
Width:	5" (12.7 cm)
Length:	6" (15.2 cm)

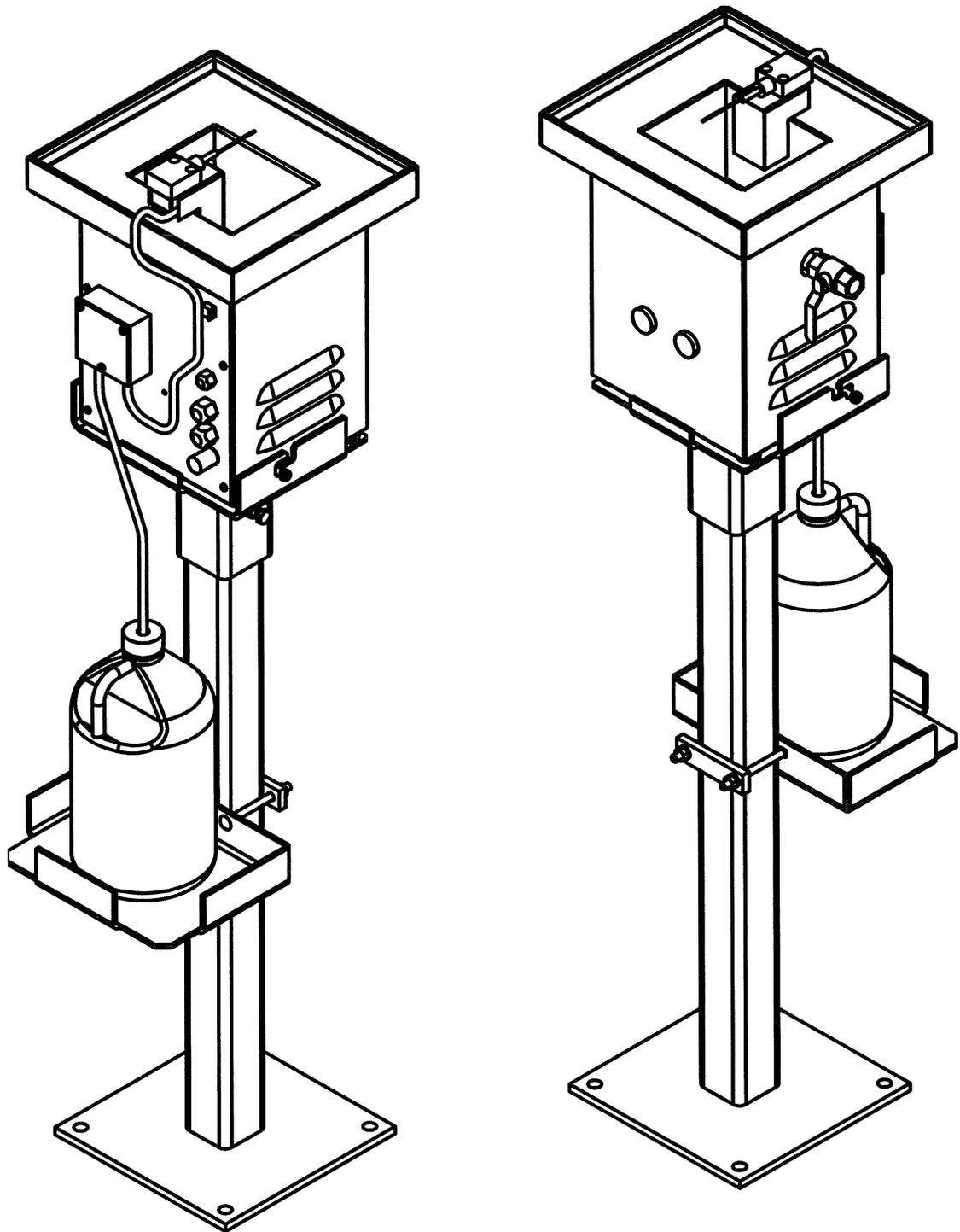
Material:

Tank:	16 gauge 316L Stainless Steel
Enclosure:	20 gauge 316L Stainless Steel

Note: Specifications subject to change without notification.

SECTION 4 - COMPONENT LAYOUT

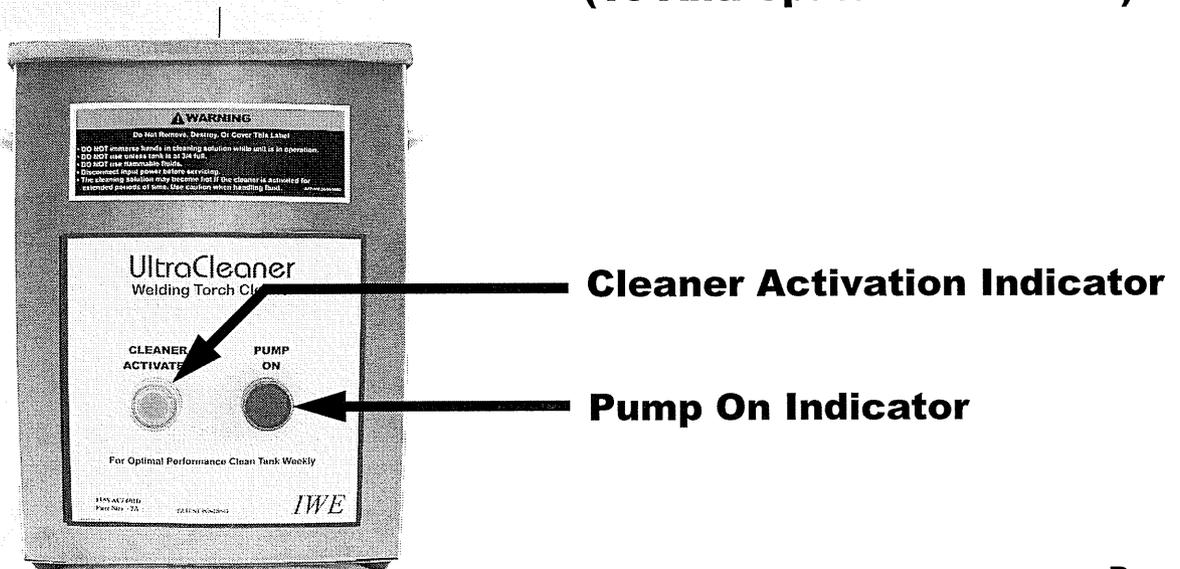
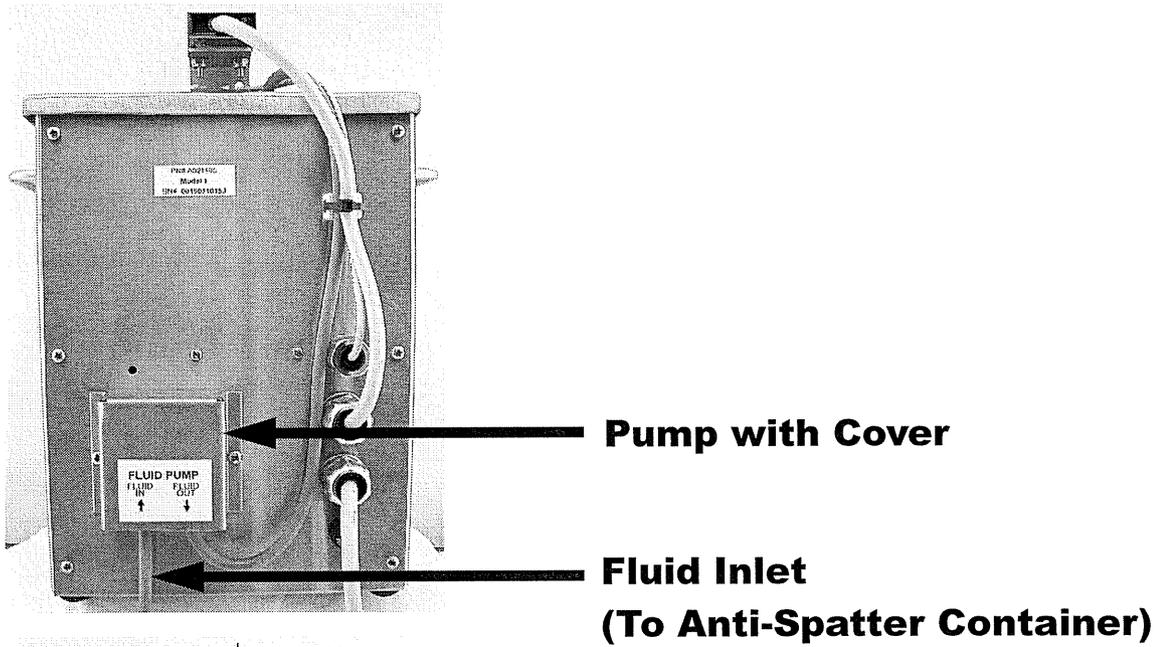
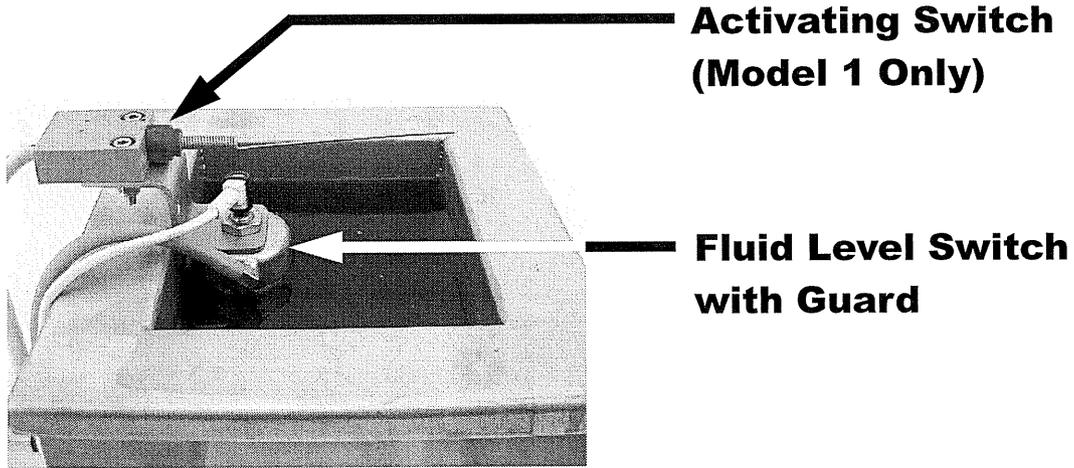
4-1 Isometric Views



SHOWN WITH OPTIONAL STAND

SECTION 4 - COMPONENT LAYOUT

4-2 Top, Front & Rear Views



SECTION 5 - INSTALLATION AND SETUP

5-1 Model 1 - Limit Switch Activated

Installation

- 1) Place UltraCleaner on a secure surface. If using the optional stand, mount it to the floor using appropriate anchors.
- 2) Fill tank with anti-spatter fluid to the bottom of the float guard. (See Figure 1, Pg. 9)
- 3) Connect supplied hose to pump inlet. (See Figure 2, Pg. 9)
- 4) Place other end of hose into the anti-spatter container (cut hose to length).
- 5) Plug unit into a grounded 120VAC receptacle.
- 6) Red "PUMP ON" light should come on indicating that the pump is filling the tank to the proper level. This may take several minutes. The pump is self priming.
- 7) Once "PUMP ON" light turns off, manually move the activating switch until "CLEANER ACTIVATED" light turns on.

The system is now ready for the robot to be programmed.

Robot Programming

- 1) Install new consumables and verify Tool Center Point is defined accurately
- 2) Remove nozzle from torch. (See Figure 3, Pg. 9)
- 3) Program the robot path to go above the tank then down into the tank until the fluid level is slightly below the gas holes in the gas diffuser.
- 4) Move the torch towards the activating switch until Cleaner Activate light comes on. Move the torch an additional 1/4" further. (See Figure 4, Pg. 9).
- 5) Make a wait statement for as much time as your cycle time will allow (2 to 3 second minimum). Use fine point or small zero zones for the final position location.
- 6) Reverse the robot path.
- 7) Replace the nozzle.
- 8) Move the torch away from the UltraCleaner and program the shielding gas (purge) or optional air-blast control to provide a burst of air to remove any excess anti-spatter fluid. Set air-blast time for 0.5 to 1.0 second. The blast can occur over a container or while the robot travels back to the home position. **DO NOT** turn on the air-blast over the UltraCleaner. Doing so may displace the fluid in the tank!
- 9) Return home.
- 10) Test the program in Teach mode (low speed) to verify the robot path and that the cleaner activates.

The system is now ready for production.

SECTION 5 - INSTALLATION AND SETUP

5-2 Model 2 - I/O Controlled

Installation

- 1) Place UltraCleaner on a secure surface. If using the optional stand, mount it to the floor using appropriate anchors.
- 2) Wire interface cable to the robot controller 24VDC output. (Circuit Diagram #1, Pg. 10)
- 3) Fill tank with anti-spatter fluid to the bottom of the float guard. (See Figure 1, Pg. 9)
- 4) Connect supplied hose to pump inlet. (See Figure 2, Pg. 9)
- 5) Cut hose to length. Insert the suction tube wire into the end of the hose and place it into the anti-spatter container.
- 6) Plug unit into grounded 120VAC receptacle.
- 7) Red "PUMP ON" light should come on indicating that the pump is filling the tank to the proper level. This may take several minutes. The pump is self priming.
- 8) Once "PUMP ON" light turns off, manually set the robot output to activate the cleaner. "CLEANER ACTIVATED" light should turn on.

The system is now ready for the robot to be programmed.

Robot Programming

- 1) Install new consumables and verify Tool Center Point is defined accurately.
- 2) Remove nozzle from torch. (See Figure 3, Pg. 9)
- 3) Program the robot path to go above the tank.
- 4) Program the output to activate the cleaner.
- 5) Program the robot path so the torch goes into the tank until the anti-spatter fluid level is slightly below the gas holes in the gas diffuser. (See Figure 4, Pg. 9).
- 6) Make a wait statement for as much time as your cycle time will allow (2 to 3 second minimum). Use fine point or small zero zones for the final position location.
- 7) Reverse the robot path.
- 8) Replace the nozzle.
- 9) Move the torch away from the UltraCleaner and program the shielding gas (purge) or optional air-blast control to provide a burst of air to remove any excess anti-spatter fluid. Set air-blast time for 0.5 to 1.0 second. The blast can occur over a container or while the robot travels back to the home position. **DO NOT** turn on the air-blast over the UltraCleaner. Doing so may displace the fluid in the tank!
- 10) Return home.
- 11) Test the program in Teach mode (low speed) to verify the robot path and that the cleaner activates.

The system is now ready for production.

SECTION 5 - INSTALLATION AND SETUP

5-3 Model 3 - Dual Robot I/O Controlled

Installation

- 1) Place UltraCleaner on a secure surface. If using the optional stand, mount it to the floor using appropriate anchors.
- 2) Wire interface cable to each robot controllers 24VDC output. (Circuit Diagram #2, Pg. 11)
- 3) Fill tank with anti-spatter fluid to the bottom of the float guard. (See Figure 1, Pg. 9)
- 4) Connect supplied hose to pump inlet. (See Figure 2, Pg. 9)
- 5) Cut hose to length. Insert the suction tube wire into the end of the hose and place it into the anti-spatter container.
- 6) Plug unit into grounded 120VAC receptacle.
- 7) Red "PUMP ON" light should come on indicating that the pump is filling the tank to the proper level. This may take several minutes. The pump is self priming.
- 8) Once "PUMP ON" light turns off, manually set the robot output from each robot controller to activate the cleaner. "CLEANER ACTIVATED" light should turn on.

The system is now ready for the robot to be programmed.

Robot Programming

- 1) Install new consumables and verify Tool Center Point is defined accurately.
- 2) Remove nozzle from torch. (See Figure 3, Pg. 9)
- 3) Program the robot path to go above the tank.
- 4) Program the output to activate the cleaner.
- 5) Program the robot path so the torch goes into the tank until the anti-spatter fluid level is slightly below the gas holes in the gas diffuser. (See Figure 4, Pg. 9).
- 6) Make a wait statement for as much time as your cycle time will allow (2 to 3 second minimum). Use fine point or small zero zones for the final position location.
- 7) Reverse the robot path.
- 8) Replace the nozzle.
- 9) Move the torch away from the UltraCleaner and program the shielding gas (purge) or optional air-blast control to provide a burst of air to remove any excess anti-spatter fluid. Set air-blast time for 0.5 to 1.0 second. The blast can occur over a container or while the robot travels back to the home position. **DO NOT** turn on the air-blast over the UltraCleaner. Doing so may displace the fluid in the tank!
- 10) Return home.
- 11) Test the program in Teach mode (low speed) to verify the robot path and that the cleaner activates.
- 12) Repeat the above steps for the second robot. Note: There needs to be interlocks to prevent the robots from crashing!

The system is now ready for production.

SECTION 5 - INSTALLATION AND SETUP

5-4 Figures 1-4

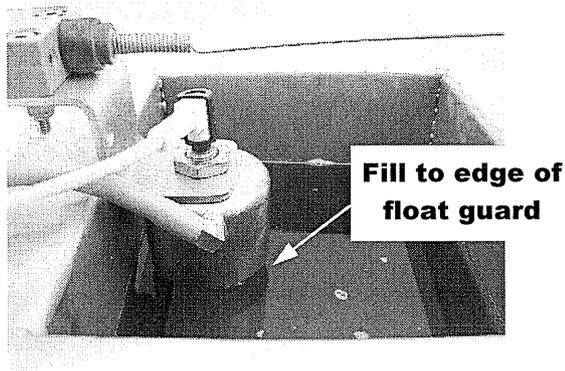


Figure 1

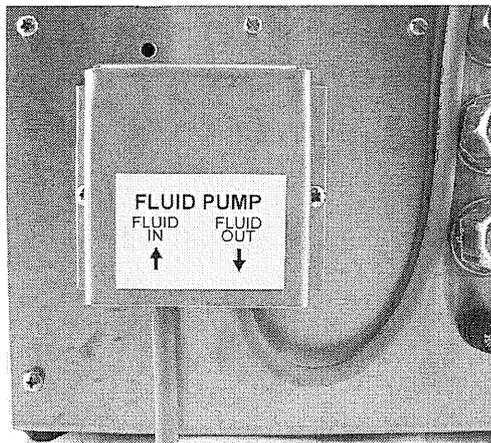


Figure 2

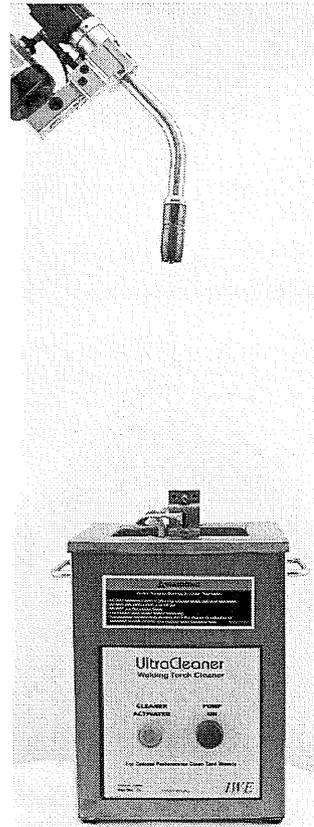


Figure 5

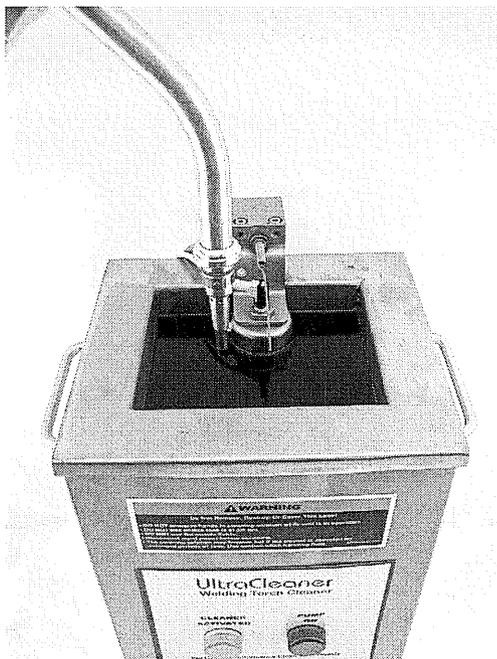


Figure 3

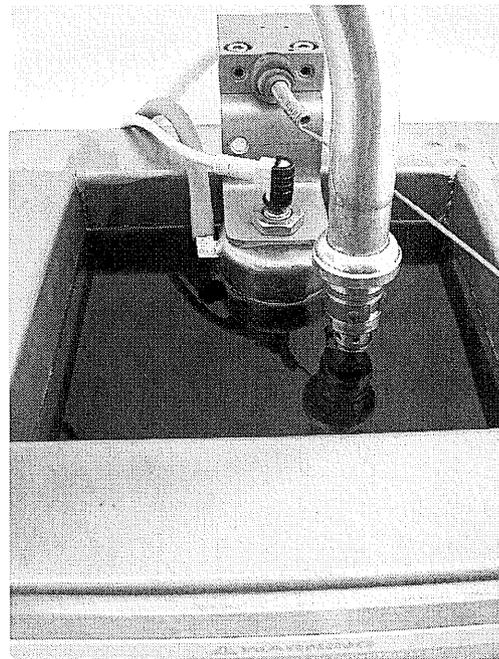
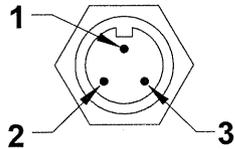


Figure 4

SECTION 5 - INSTALLATION AND SETUP

5-5 Circuit Diagram #1 - Model 1 Limit Switch Control

AC INPUT POWER RECEPTACLE



- 1- GND
- 2- 120VAC (L1)
- 3- COMMON (L2)

ULTRACLEANER

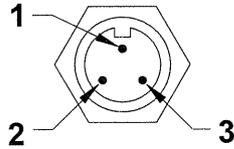
3 PIN

- 1 ← GND
- 2 ← 120VAC (L1)
- 3 ← COMMON (L2)

SECTION 5 - INSTALLATION AND SETUP

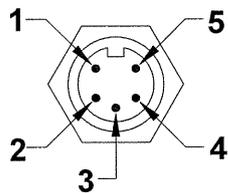
5-6 Circuit Diagram #2 - Model 2 I/O Control

AC INPUT POWER RECEPTACLE

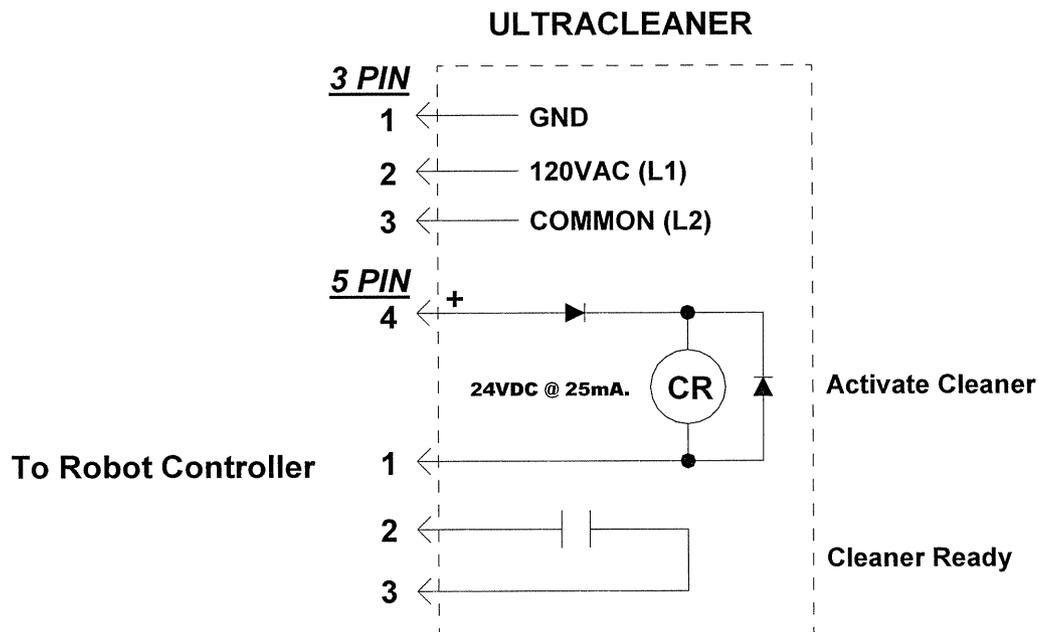


- 1- GND
- 2- 120VAC (L1)
- 3- COMMON (L2)

INTERFACE RECEPTACLE



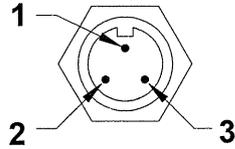
- 1- 0VDC INPUT
- 2- CLEANER READY (COMMON)
- 3- CLEANER READY (SIGNAL)
- 4- +24VDC INPUT (ACTIVATE CLEANER)
- 5- NO CONNECTION



SECTION 5 - INSTALLATION AND SETUP

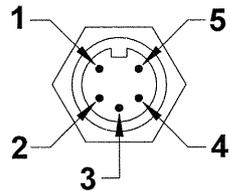
5-7 Circuit Diagram #3 - Model 3 Dual I/O Control

AC INPUT POWER RECEPTACLE

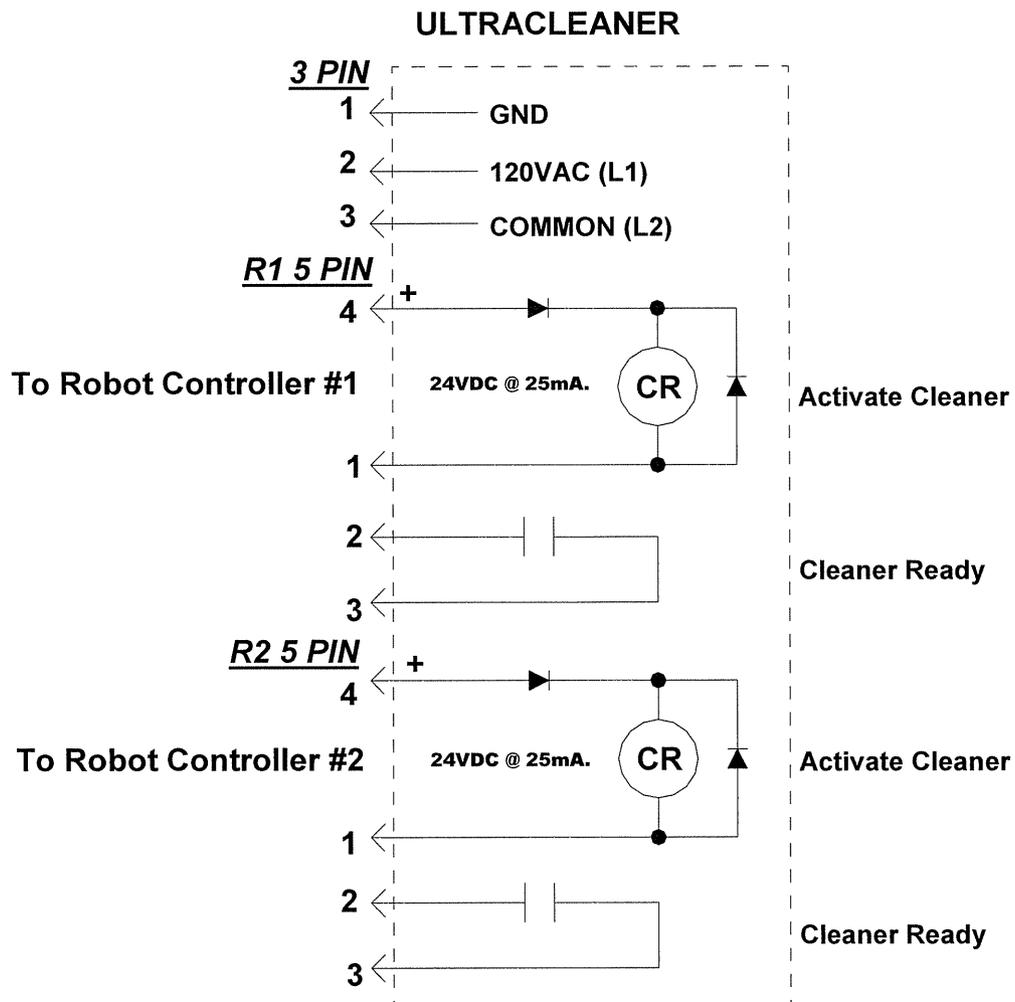


- 1- GND
- 2- 120VAC (L1)
- 3- COMMON (L2)

INTERFACE RECEPTACLE R1 AND R2



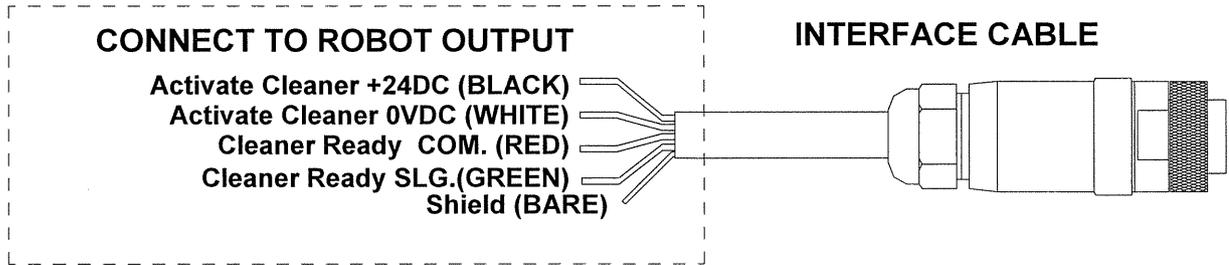
- 1- 0VDC INPUT
- 2- CLEANER READY (COMMON)
- 3- CLEANER READY (SIGNAL)
- 4- +24VDC INPUT (ACTIVATE CLEANER)
- 5- NO CONNECTION



SECTION 5 - INSTALLATION AND SETUP

5-8 Circuit Diagram #4 - Optional Robot Interface Cable

ROBOT CONTROL CABINET



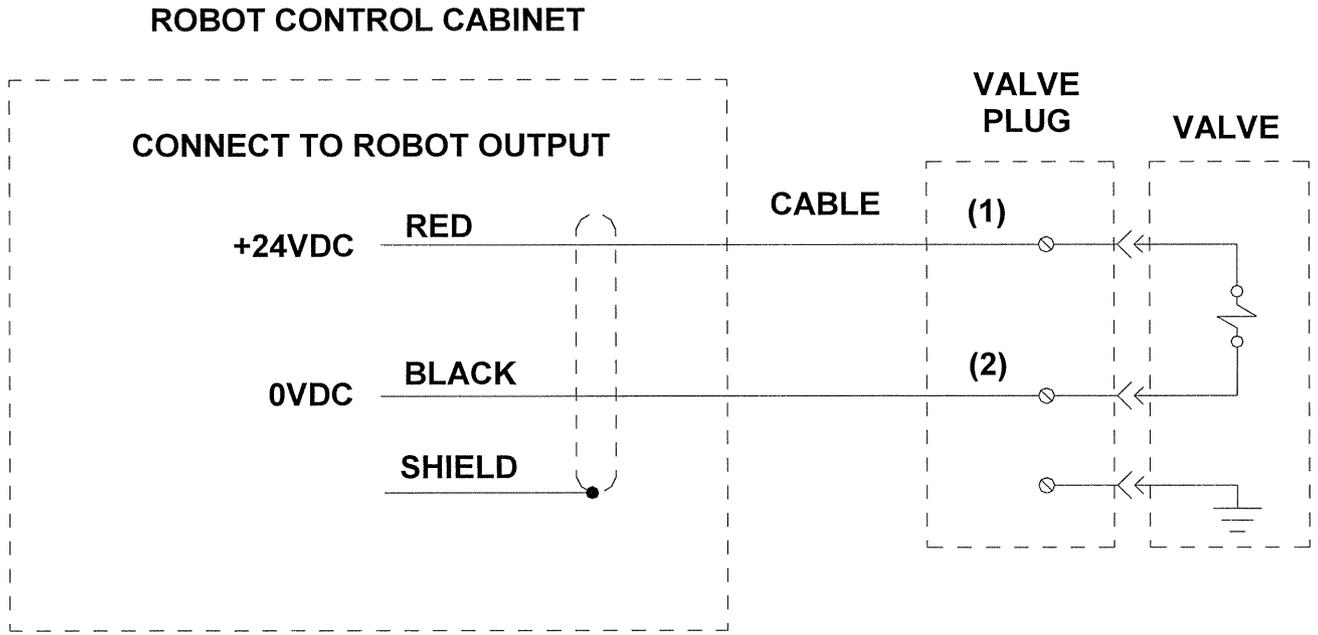
SECTION 6 - OPTIONAL AIR-BLAST CONTROL

6-1 Installation

- 1) Mount air valve assembly.
- 2) Wire valve to robot I/O. (See Circuit Diagram #5 & #6 Pg. 15)
- 3) Connect outlet from the valve to the torch air-blast line.
- 4) Connect input to air supply. Set air pressure below maximum rating of components.
(Maximum air pressure varies by torch manufacturer.)
- 5) Program the air-blast output so after cleaning the torch in the UltraCleaner a 1.0 to 1.5 second air blast occurs. The air-blast can occur over a container or while the robot travels back to the home position. Make sure that the torch is far enough away from the fluid so that the air blast does not displace the fluid in the tank!

SECTION 6 - OPTIONAL AIR-BLAST CONTROL

6-2 Circuit Diagram #5- w/DIN Connector & 25ft Cable



OUTPUT REQUIRED: 24VDC @ 120mA.

SECTION 7 - MAINTENANCE

- For optimal performance, clean tank weekly.
- Use proper personal protection while handling the fluid.
- Make sure fluid is not hot before handling!
- Use a shop vacuum or plant vacuum system to clean out all the fluid and spatter. Dispose of fluid in accordance with local city, state and federal requirements.
- You can also use a magnet brush to periodically remove spatter.
- Make sure there is enough fluid remaining in the anti-spatter container to refill the tank (approximately 1/2 gallon).
- The tank will refill automatically in approximately one hour.

SECTION 8 - WARRANTY

LIMITED WARRANTY

LIMITED WARRANTY – THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within one (1) year, International Wire Exchange, Troy, Michigan will repair or replace any warranted parts or components that fail due to such defects in material and/or workmanship. IWE must be notified in writing within thirty (30) days of such defect or failure, at which time IWE will provide instructions on the warranty claim procedures to be followed.

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

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at International Wire Exchange option: (1) repair; or (2) replacement; or (3) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at the customer's risk and expense. International Wire Exchange option of repair will be F.O.B., factory Troy Michigan. 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 INTERNATIONAL WIRE EXCHANGE BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGE (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 INTERNATIONAL WIRE EXCHANGE IS EXCLUDED AND DISCLAIMED BY INTERNATIONAL WIRE EXCHANGE.

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 damage, 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.