



Electronic Assembly Equipment

ITW EAE

INTRODUCTION

Thank you for purchasing your Electrovert Electra Wave Soldering Machine

This document contains information to answer all the frequently asked questions in relation to the installation of your Electra Wave Soldering Machine

Section 1 – Important Installation Requirements

Section 2 – Leveling the Machine

Section 3 – Facility Requirements, Connections, and Capacities

Section 4 – Training

Section 5 – Machine Footprint/Spec Drawings

If you have any further questions please don't hesitate to contract the Electrovert Tech Support Group @ 800-737-8110 Option 3 or evtsupport@itweae.com.

Thank you for your cooperation, may I take the opportunity of wishing you many years of quality production with your new Electra Wave Soldering System.

Sincerely,

Pat O'Brien
Vice President/General Manager

Electrovert

Electronic Assembly Equipment

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Electra™ WAVE SOLDERING SYSTEM

PRE-INSTALLATION INSTRUCTION



Customer Service and Support

ELECTROVERT

1629 Old South 5 Camdenton,
MO 65020 U.S.A.

800-737-8110 Option 3

evtsupport@itweae.com



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Important Installation Requirements

It is critical that both your facility and your employees are ready for the ITW EAE Field Service Engineer's visit to install your new machine. Please review the list below and let us know if you have any questions. Failure in preparation may incur delays in the installation and additional costs if we have to come on a later date because you were not ready.

Pre-Installation Checklist – Note: Before the FSE arrives the Machine must be in place, leveled, and below items completed or on hand.

Item		Confirm
Machine in place and leveled		<input type="checkbox"/> Yes <input type="checkbox"/> No
Main Electrical Supply connected Machine Voltage:_____vac. *	_____ Voltage	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pneumatic Supply connected* N2 Supply connected *		<input type="checkbox"/> Yes <input type="checkbox"/> No
Exhaust Sytem connected and working *		<input type="checkbox"/> Yes <input type="checkbox"/> No
Solder – whether Lead or Lead Free Alloy		<input type="checkbox"/> Yes <input type="checkbox"/> No
Flux , Alchol, Thinner/Water if needed. Minimum 5 gallons each.		<input type="checkbox"/> Yes <input type="checkbox"/> No
Test Product (PCB's and/or Pallets)		<input type="checkbox"/> Yes <input type="checkbox"/> No

* Refer to the **Section 3.0** or **Eng. Data Sheet** or **Sales Drawing** for proper requirements.

For any questions or concerns on the above Installation Check List contact Electrovert Tech Support Group @ 800-737-8110 or etsc@itweae.com.

SECTION 1.0: INSTALLATION PREPARATION

1.1 RECEIVING INSTRUCTIONS

Upon receipt, thoroughly inspect the system. If any damage or loss is detected, enter all details on the freight bill or receipt, and then have it signed by the carrier agent. Failure to follow this procedure may result in the carrier's refusal to honor the claim. The carrier is responsible to furnish the necessary forms for filing a claim.

When damage is not readily apparent until the equipment has been unpacked, file a claim for concealed damage. Make a written or telephone request to the carrier for inspection as soon as the damage is discovered. This type of claim must be completed within 48 hours of delivery.

Keep all cartons, packing materials and paperwork. The carrier will furnish an inspection report and the necessary forms for filing the concealed damage claim.

1.2 INSTALLATION PLANNING

Allocate sufficient floor space for efficient operation and accessibility from all sides. Refer to the Engineering Data Sheet and Installation Drawing for machine footprint, weight, and facility connections and requirements.

Clearance behind the system is especially important since service operations are performed from the rear of the machine. It is recommended that 2 m (6 ft) of space is allocated at the rear of the machine for safe access around the solder pot when rolled out.

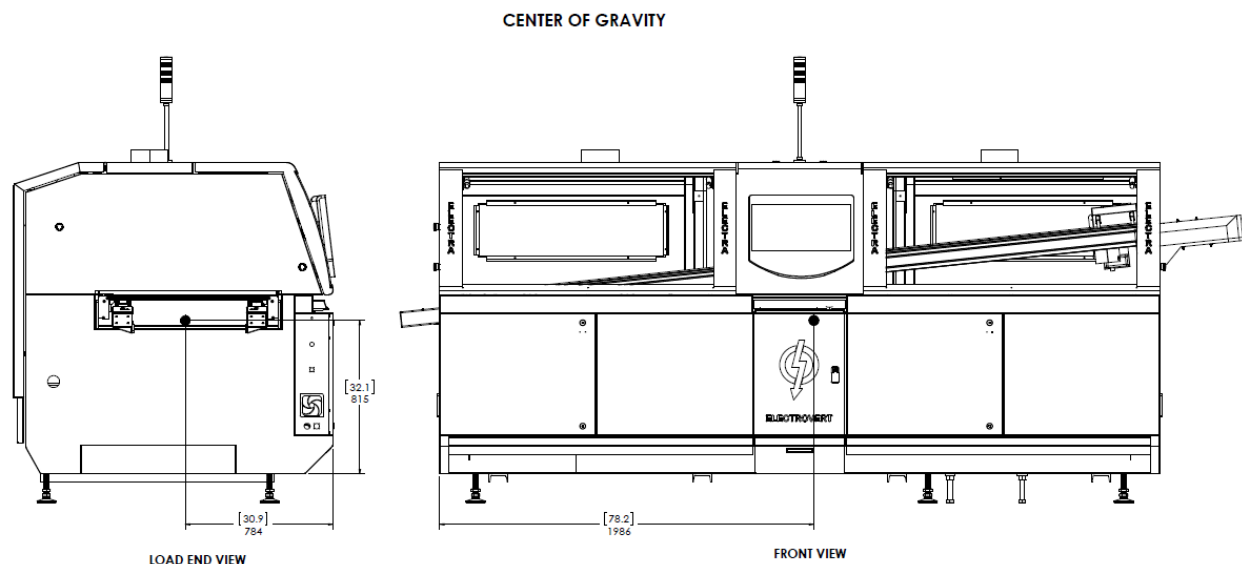
Install the system on a solid (anti-vibration), level floor capable of supporting the machine's weight. Also keep in mind the flammability of the materials (i.e. fluxes and thinners) used during normal operation.

Allow additional space for storage of process materials such as flux, thinner, and solder. The storage containers for these should be remote and protected to minimize the risk of fire outside the machine.

Machine Shipping Weight

Shipped on casters: 2540 kg (5600 lbs.)

Crated: 2900 kg (6400 lbs.)





4. Use a 1 ½ in. socket with ratchet to remove the shipping plates from the machine frame.
5. Install the leveling legs by screwing them into the frame where the shipping plate bolts were removed. The legs should extend approximately 100 mm (4 in.) from the base of the system frame. Ensure the consistency of this distance with each leg.
6. Carefully position the system into place for installation.
7. Slowly lower the system onto the leveling legs at the site of installation and remove the fork lift.

1.3 CASTER REMOVAL (DOMESTIC SHIPMENT)

If equipped, the machine is mounted on six (6) caster weldments. Bolts are installed in the existing leveling foot locations to secure the casters to the underside of the system frame.

Refer to the following procedure to remove the casters from the machine.

1. Position pallet jacks at each end of the machine or carefully position a fork lift, with the fork extensions at their widest setting, under the frame. Make sure that the forks make proper contact with the base beams to avoid damage to the wiring and metal panels underneath the machine.
2. Carefully raise the system high enough to remove the casters and bolts from the system frame. Refer to the Appendix section for the location of the center of gravity.
3. Use a 1 ½ in. socket with ratchet to remove the six (6) bolts from the machine frame.
4. Install the leveling legs by screwing them into the frame where the bolts were removed. The legs should extend approximately 100 mm (4 in.) from the base of the system frame. Ensure the consistency of this distance with each leg.
5. Carefully position the system into place for installation.
6. Slowly lower the system onto the leveling legs at the site of installation.
7. Place the six (6) caster weldments and two (2) shipping strap brackets in the empty shipping box provided with the machine and ship them back to the factory.

1.4 OPENING REAR DOOR/UNPACKING INTERNAL COMPONENTS

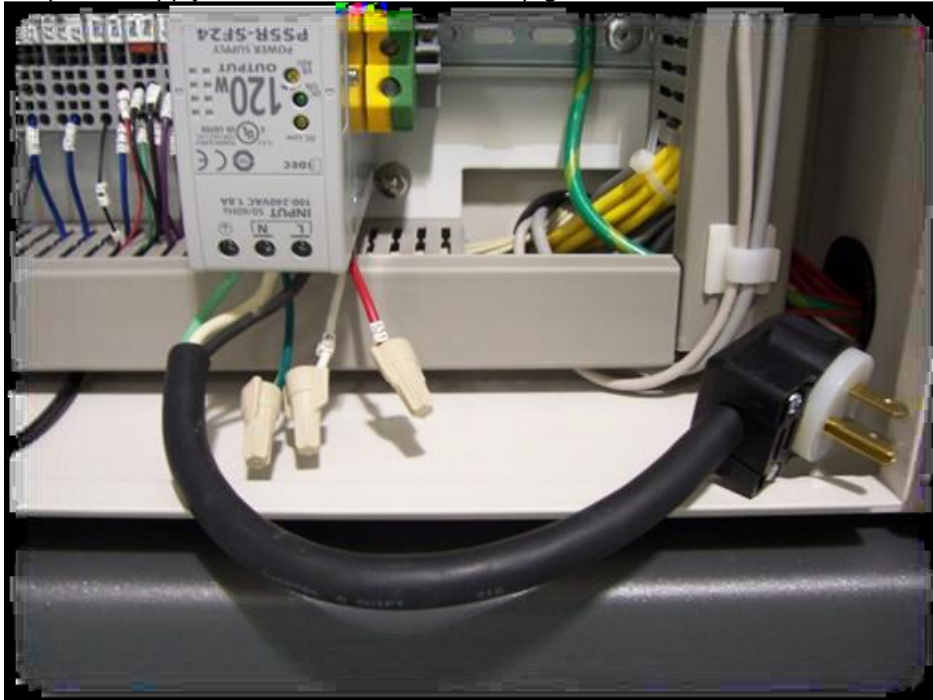
Carefully remove the machine packing materials according to the following procedures. Note that the brackets used to secure the internal components during shipment are "red" in color for visual identification. Completely inspect the machine after following these procedures to insure all shipping components have been removed.

1. Remove all strapping and/or plastic wrap around the exterior of the machine.
2. Remove the foam padding between hoods/panels.
3. At this point, an external power source must be supplied to the rear door actuator circuit to open the rear door using the following procedures.
4. Verify no electrical power is connected to the machine and unlock the load end electrical cabinet using the special tool included in the tool kit.
5. Locate the rear door actuator power supply (PWS 3) in the load end electrical cabinet (wire numbers 51 & 49 will be connected to the input side "L" & "N") and locate the electrical pigtail and wire nuts in the toolkit.
6. Also in the load end electrical cabinet locate TB-51 (terminal blocks #501 & 524 on machines with UPS option or CB-500 wire #524 and terminal block #501 on machines without UPS option. And locate the violet wire jumper with warning label in the toolkit.





7. Disconnect and individually wire nut the three (3) wires (#51, 49, ground) on the input side "L" & "N" of the power supply and connect the electrical pigtail as shown.

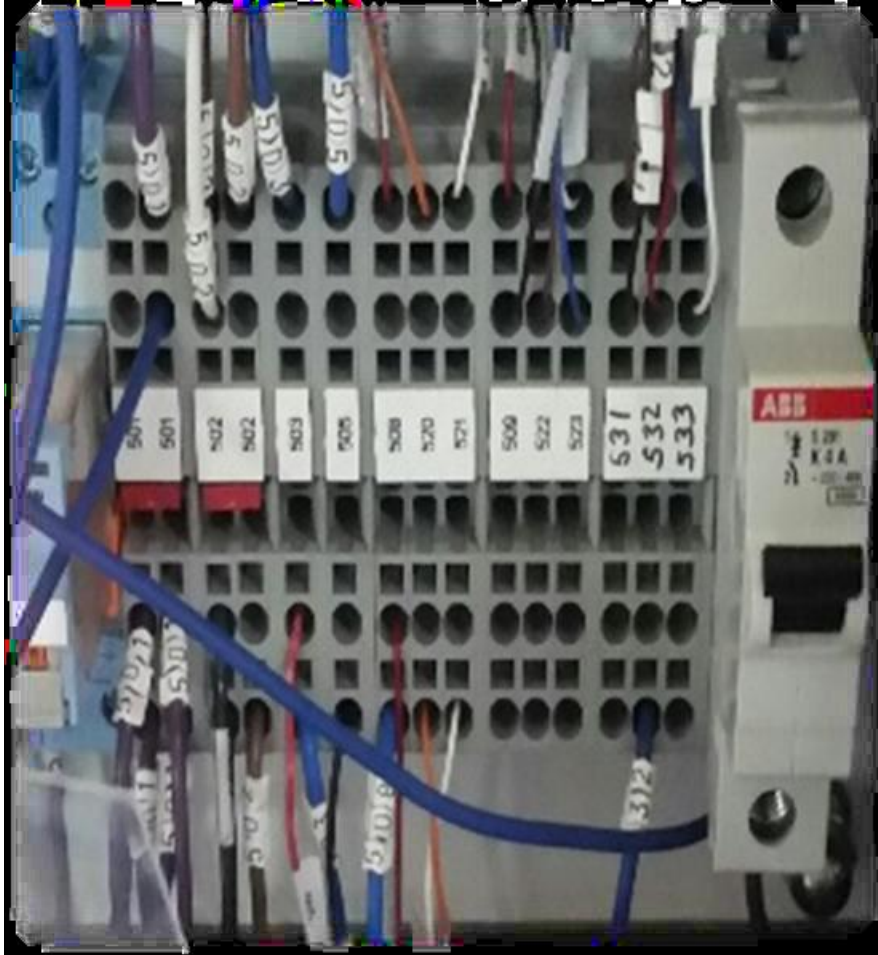


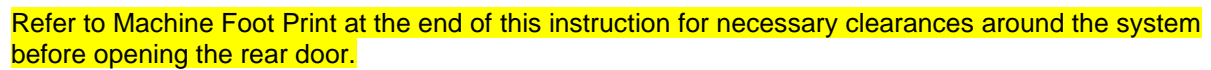
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8. Connect the plug end of the electrical pigtail to a 120-240V/1Phase power source.
9. Connect the violet jumper wire from CB-500 wire #524 to TB-51 terminal block #501 for machines without UPS option (see below picture on left). On machines with UPS option (see below picture on right), run jumper from TB-51 terminal block #524 to terminal block #501.







11. Once all shipping brackets and packing materials have been removed, the rear door should be returned to the “closed” position for machine leveling using the momentary switches. Verify the solder pot, preheaters, fluxer, fluxer control box drawer, and finger cleaner tank drawer are all in the “closed” position and the fold-down rollout stand is locked in the “up” position prior to closing the rear door.

2.0 LEVELING THE MACHINE

The machine is configured with leveling legs used for height adjustment and leveling. The leveling must be performed in both the front-to-rear direction and the load-to-unload direction. The machine should be set at a height such that access to regular maintenance and adjustment devices are located 0.4-2.0 m (1.3-6.6 ft) above the floor. **The Field Service Engineer will doublecheck the Level during the Installation.**

1. Place machine to be aligned with upstream and downstream equipment with a 10 mm (0.39 in) gap between adjoining conveyors.
2. Close the rear door and front doors and hoods before leveling.
3. Use a crescent wrench and adjust the center leveling legs so they do not touch the floor. The machine will be supported by only the four (4) leveling legs located at each corner of the machine.
4. Alternately adjust the corner leveling legs until the conveyor reaches the required height.
5. Place a spirit (bubble) level underneath the center of the front load-to-unload main frame beam.
6. Adjust the front load and unload leveling legs until the level indicates proper positioning.



LEVEL



7. Place a spirit level underneath the load end main frame member.
8. Adjust the rear load leveling leg until the level indicates proper positioning.
9. Repeat steps 7 and 8 on the unload end of the machine.
10. Verify the load-to-unload position is still level.
11. Adjust the center leveling legs until they just make contact with the floor. Turn them an additional $\frac{1}{2}$ turn to support the weight of the center of the machine.
12. Visually inspect the load-to-unload main frame member to insure it is not “sagging” or “bowing”.
(Correct such conditions by adjusting the center legs until frame is straight but making certain all legs are contacting the floor.)

SECTION 3.0: SPECIFICATIONS/CAPACITIES

Solder Pot Capacity:

20" Machine

Tin/Lead 63/37 Solder: Single wave 840 kg (1850 lbs.) Dual Wave 820 kg (1810 lbs.)

Lead Free Solder: Single Wave 730 kg (1610 lbs.) Dual Wave 726 kg (1601 lbs.)

24" Machine

Tin/Lead 63/37 Solder: Single Wave 921 kg (2030 lbs.) Dual Wave 900 kg (1984 lbs.)

Lead Free Solder: Single Wave 801 kg (1766 lbs.) Dual Wave 797 kg (1757 lbs.)

Finger Cleaner Reservoir: 15 L (4.0 Gal.)

Spray Fluxer : Depending on type have on hand at least 15 L (4.0 Gal) of Flux and Solvent

3.1 AIR/NITROGEN CONNECTIONS

The machine requires a clean, dry compressed air (CDA) supply and a filtered, contamination-free nitrogen supply. The connections are made via 1/2 in. NPT fittings on the top center panel. Please refer to the **Engineering Data Sheet** or **Sales Drawing** for supply line requirements.

To provide for lock-out/tag-out safety protection of the pneumatic system, a lockable safety exhaust valve rated for a minimum of 1380 kPa (200 psi) must be installed to properly turn off the gas supply and vent residual gas. McMaster Carr part number 4628K83 is an example of a suitable component.

Supply the machine nitrogen inlet only with nitrogen that has a purity of $\leq 4\text{ppm}$. Use of other gases could interfere with the process and introduce additional safety hazards.

Compressed Air, Clean and Dry: 415-690 kPa (60-100 psi)

Nitrogen: 415-690 kPa (60-100 psi)





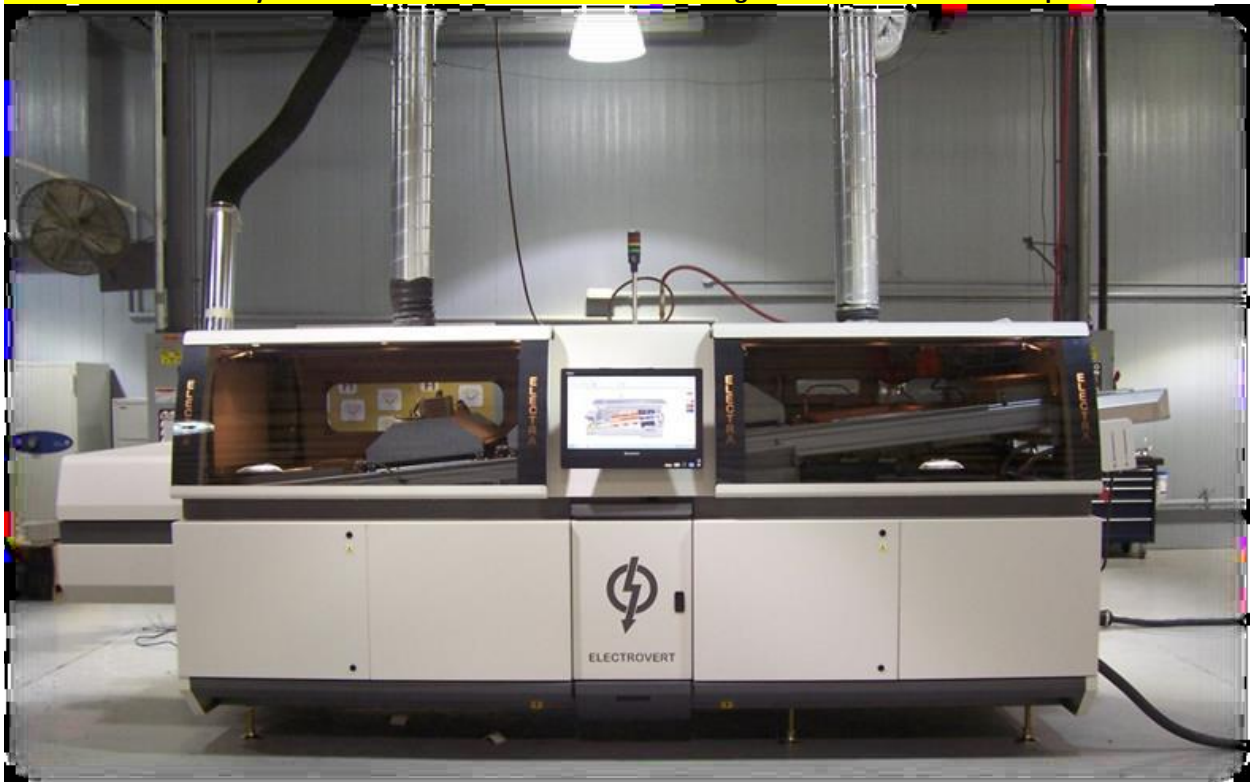
3.2 EXHAUST CONNECTIONS

External Fluxer (optional): Exhaust Port 152mm (6.0 ") 850 m³/hr (500 SCFM)

Load End: Exhaust Port 203mm (8.0 ") 1019 m³/hr (600 SCFM)

Unload End: Exhaust Port 203mm (8.0 ") 1359 m³/hr (800 SCFM)

Our FSE will confirm if you have the correct Exhaust Flow according to our minimum Exhaust Specs.



3.3 ELECTRICAL CONNECTIONS

Visually inspect all electrical connections to see if any are noticeably loose or damaged as a result of transit. There are electrical components in the electrical cabinet as well as on the Convection Preheaters where the blowers are wired. Check for any debris that may have fallen onto a connection during uncrating and clean out any dust or particulate matter.

The operating voltage for the machine is listed on the machine serial name plate located at the unload end of the machine. Before connecting power to the machine, it is necessary to verify that the facility voltage corresponds to the voltage on the serial name plate using the following procedure.

1. Using a digital voltmeter set to the expected range, measure the facility voltage across L1 and L2.
2. Measure the facility voltage across L2 and L3.
3. Measure the facility voltage across L1 and L3.
4. These three (3) voltage measurements should be within 2% of each other and within 5% of the voltage listed on the machine serial name plate.
5. If the power does not match, do not apply power. Contact Speedline Electrovert Technical Support.

Supply frequency must be within 1% of nominal and harmonics not exceeding 10% of the total r.m.s. Voltage interruptions must not be more than 3 ms at any random time with more than 1 s between successive interruptions. Voltage dips not exceeding 20% of the peak supply voltage must have more than 1 s between successive dips.

Supply conductor sizing recommendations are listed below for a fully loaded machine. The conductor should be rated for 75°C (167°F) and used in a 30°C (86°F) ambient temperature. If the conductor is sized based on the machine serial name plate ratings it should be increased by one wire size to allow for future upgrades.

- 380-415 V: Copper 67.40 mm² (2/0 AWG); Aluminum 107.16 mm² (4/0 AWG)
- 440-480 V: Copper 53.46 mm² (1/0 AWG); Aluminum 67.40 mm² (2/0 AWG)

Before connecting power to the machine, ensure the facility power is locked out. Also, connect the wiring to the machine before connecting the wiring to the facility power. The customer must provide a fuse or circuit breaker for overcurrent protection between the facility power and the machine and then complete the following procedures.

1. Open the unload electrical cabinet door that contains the connection to the Main Power Disconnect Switch
2. Locate the Main Power Disconnect Switch (SW-01) in the electrical cabinet.
3. Remove the cover that houses the Main Power Disconnect bar.
4. Locate the main power inlet at the unload end of the electrical cabinet.
5. Route the house supplied power cords through the house supplied conduit connector at the power inlet.
6. Connect the ground line to the yellow and green ground connector.
7. Connect the power lines to SW-01. Connect the lines so that they enter the hex lug connector from the back of the switch. Refer to chart in Complete Installation Manual Section 4.3 for torque specifications.
8. Connect the power lines to the facility power.

Field Service Engineer will install Computer and Interface

3.4 ELECTRICAL VERIFICATION

The following voltage check exposes personnel to dangerous voltage levels. This procedure is only to be performed by adequately trained personnel.

Using a digital voltmeter set to the expected range, measure the voltage at the L connectors at the Main Power Disconnect Switch (SW-01) in the electrical cabinet. The voltage between any two (2) L connectors (i.e. L1-L2, L2-L3, or L1-L3) should be approximately the same as the previously measured facility voltage. Note that this is a phase-to-phase measurement (not phase-to-ground).

Replace the cover that houses the Main Power Disconnect bar and close and lock the electrical cabinet before proceeding. **DO NOT turn on Power to your machine. The Field Service Engineer from Electrovert will turn on and test the Machine when they arrive to do the Installation.**

Once the Machine is in place and all facility connections have been made then at this point you are ready for our Field Service Engineer to come in and begin the Installation of your Electra Wave Soldering Machine.

4.0 TRAINING AT INSTALLATION

As part of the Installation process, ITW EAE offers a complimentary “up and running” Training Program. This covers the basic Operation, Maintenance and Process Setup of the Electra Wave Soldering Machine and associated options.

Training Summary

Customer Start-Up Training

- The FSE (Field Service Engineer) will provide a minimum of 8 hours of Training.*
- The FSE will provide a minimum of 2 hours of Training for up to 4 Operators*
- The FSE will provide a minimum of 4 hours of Training for up to 4 Maintenance Technicians*
- It is recommended that at least 1 or 2 Maintenance Technicians work with FSE during the Installation so that they can get a clear understanding of how the Electra subassemblies go together and come apart.
- The FSE will provide a minimum of 2 hours of Training for up to 4 Process Engineers*
- All of the above Training also includes Software Operation.
- Verify that all machine functions and machine options are working correctly.
- The FSE will then demonstrate that the system performs to specification using the Customer's supplied PCB and assist in creating at least one Wave Soldering Recipe.

***NOTE:** The customer's personnel are expected to devote the entire time to the training program. Hours not devoted by the customer may not be “banked” for later use.

Additional Training

A full range of Training Courses are available covering Operation, Maintenance and Process. Courses are conducted at our ITW EAE facilities in Camdenton, MO. If this is not feasible you can also request ‘On Site’ Training. Contact us for Pricing and availability.

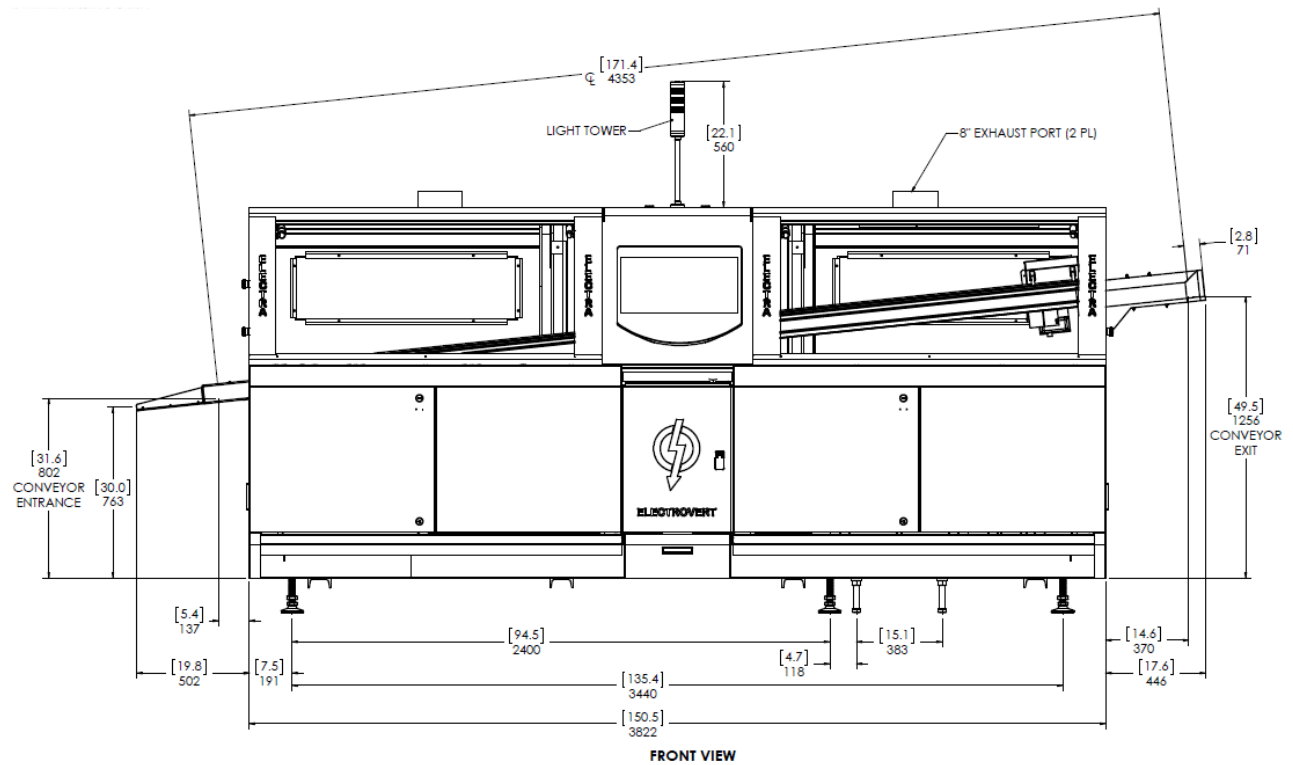
For further information, including course descriptions and schedule please contact the Training Department or visit <http://www.itweae.com/services-and-support/americas>

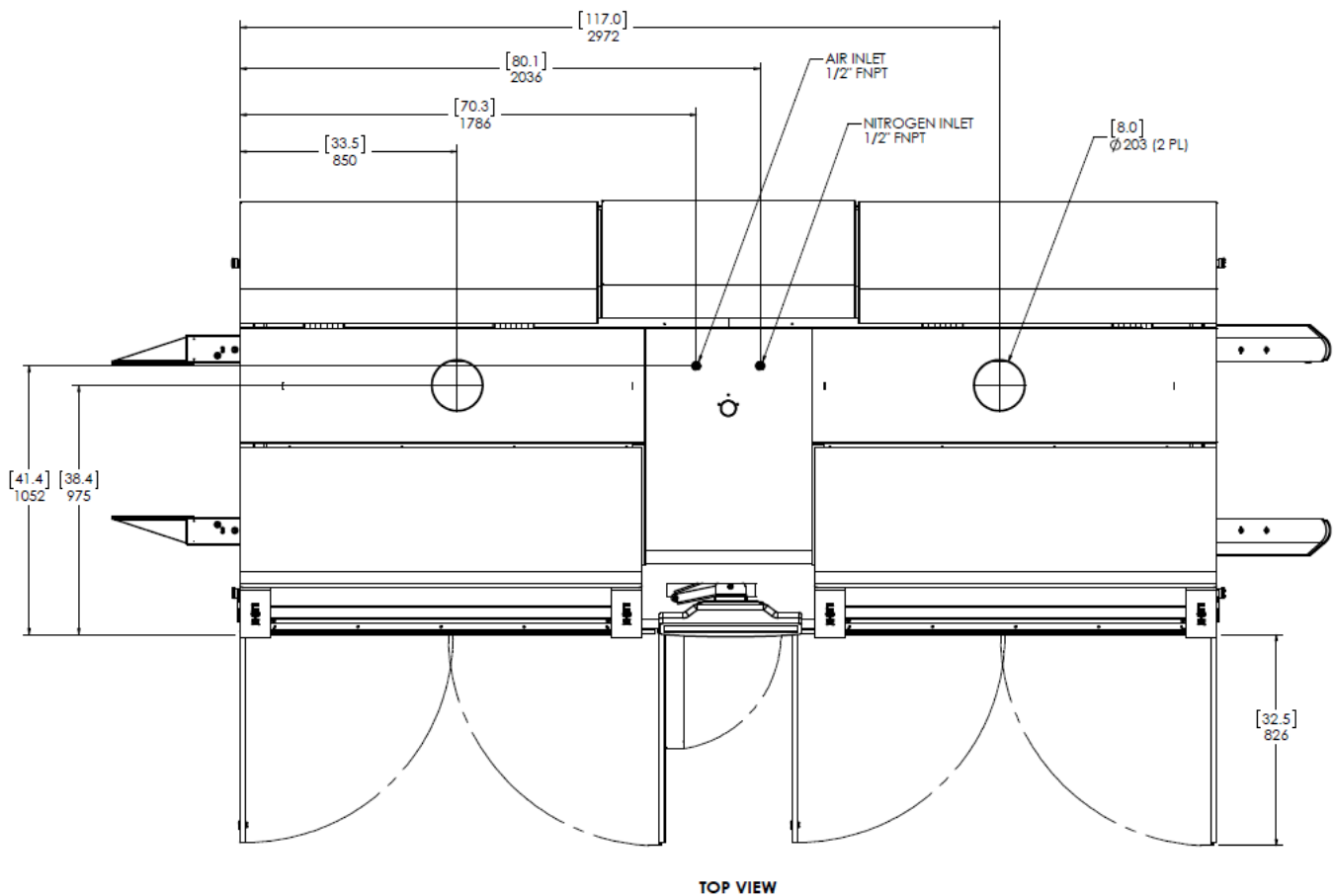
NEED CONSUMABLES?

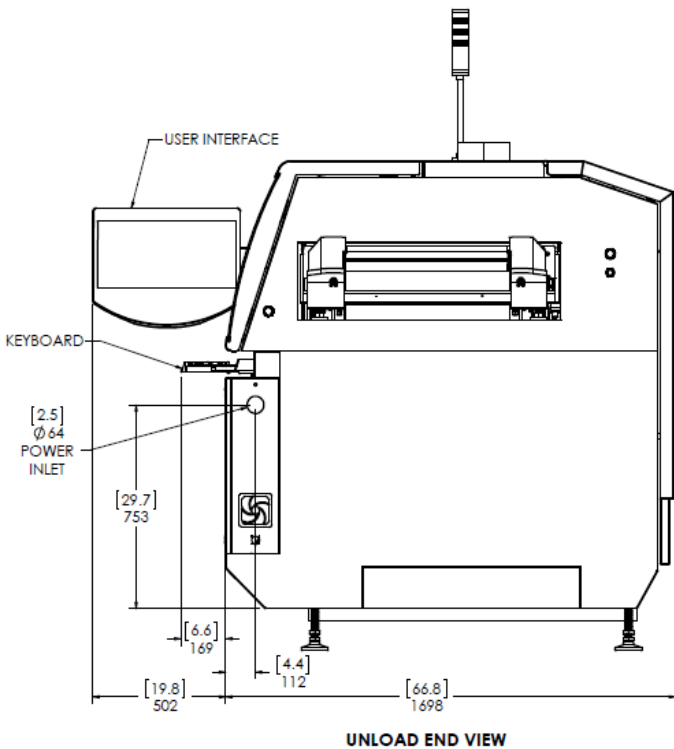
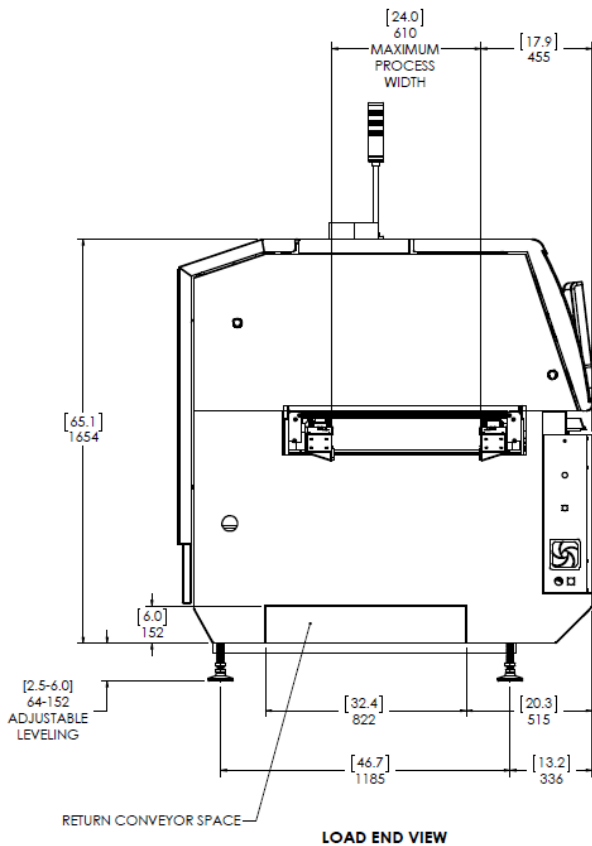
*For current pricing and availability please contact our Parts Department at usparts@itweae.com.

*For any questions you may also contact us at 800-737-8110.

5.0 Machine Foot Print



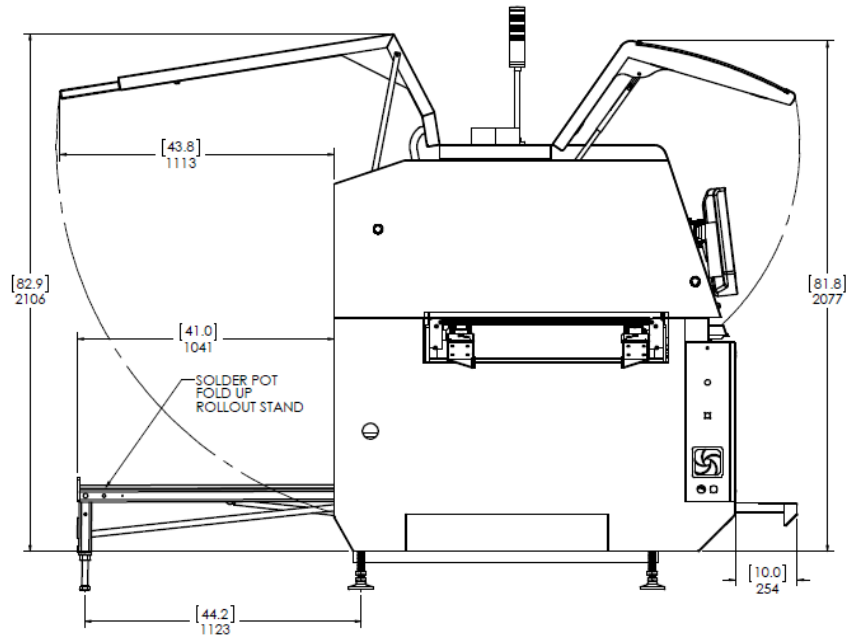




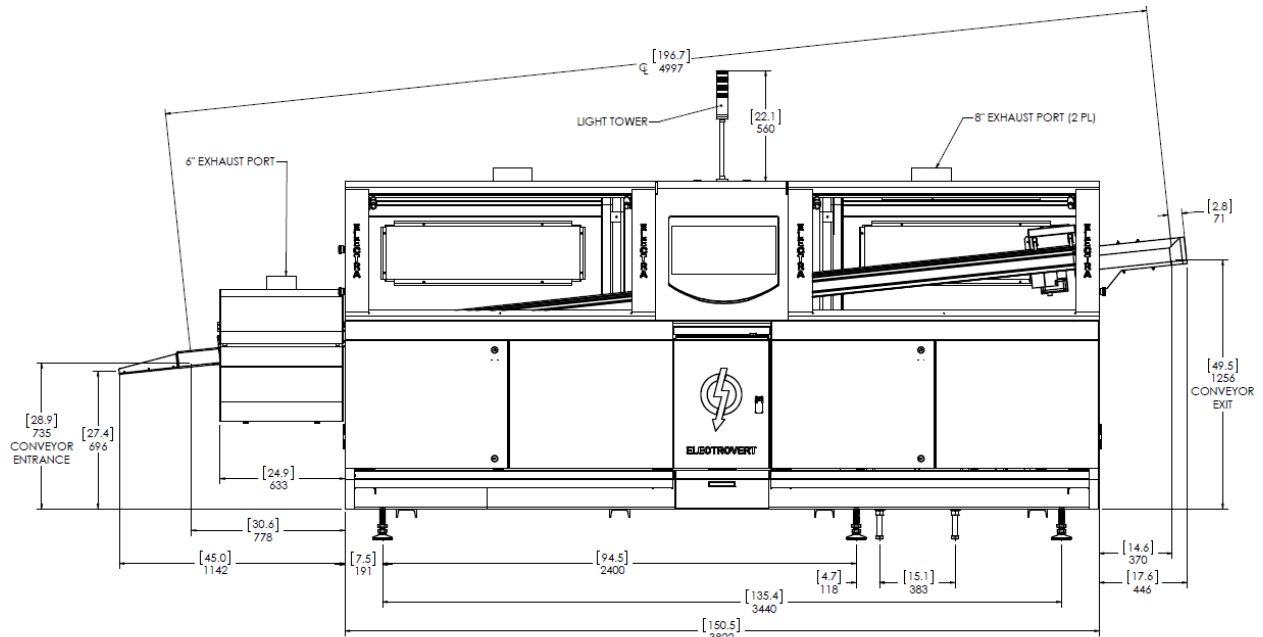
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LOAD END VIEW OPENED

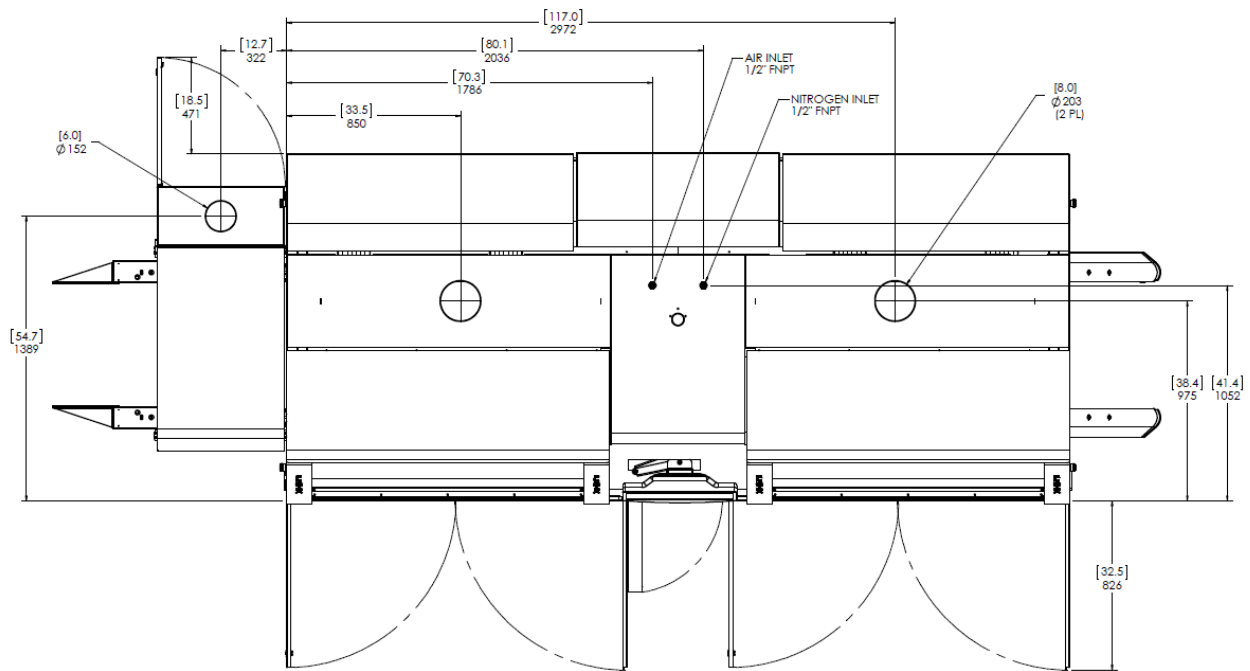


FRONT VIEW WITH EXTERNAL FLUXER

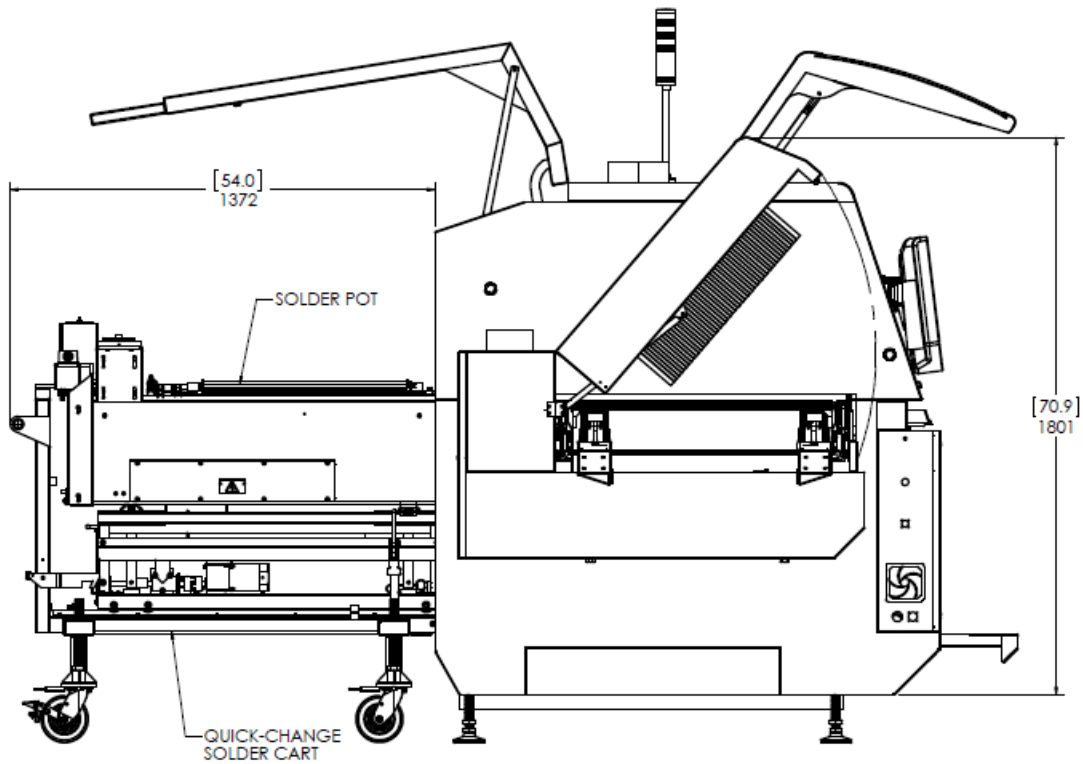
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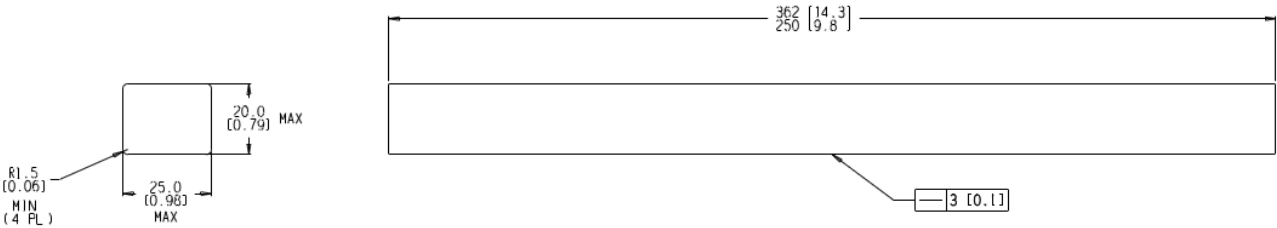


TOP VIEW WITH EXTERNAL FLUXER

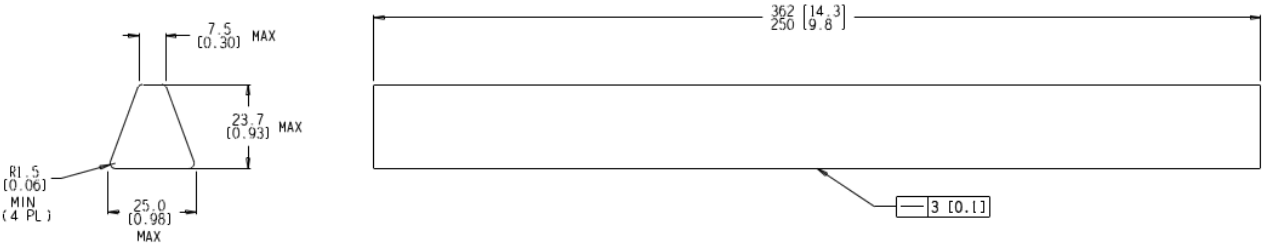


LOAD END VIEW OPENED WITH EXTERNAL FLUXER AND QUICK-CHANGE SOLDER CART

SQUARE SOLDER BAR ACCEPTABLE DIMENSIONS



TRIANGLE SOLDER BAR ACCEPTABLE DIMENSIONS





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TRAINING AT INSTALLATION

As part of the Installation process, ITW EAE offers a complimentary “up and running” training program. This covers the basic operation, maintenance and programming of the cleaner and associated options.

Training Summary

Customer Start-Up Assistance Training

- The FSE (field service engineer) will provide maximum of 4 hours of training for up to four process engineers)
- The FSE will provide a maximum of two hours of training for up to four operators.
- The FSE will provide a maximum of two hours of training for up to four maintenance technicians.
- The FSE will then demonstrate that the system performs to specification using the customer’s production materials

***NOTE:** The customer's personnel are expected to devote the entire time to the training program. Hours not devoted by the customer may not be “banked” for later use.

Additional Training

A full range of training courses are available covering operation, maintenance and process. Courses are conducted at our ITW EAE facility in Camdenton, MO.

For further information, including course descriptions and schedule please contact the Training Department or visit <http://www.itweae.com/services-and-support/americas>

NEED CONSUMABLES?

*For current pricing and availability please contact our Parts Department at parts@itweae.com.

*For any questions you may also contact us at 800-737-8110 Option 4.