Aerowerks®

INSTRUCTION MANUAL FOR MODEL TAC

TRAY ACCUMULATOR CONVEYOR SYSTEM

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OPERATING INSTRUCTION MANUAL FOR MODEL TAC
TRAY ACCUMULATOR CONVEYOR SYSTEM

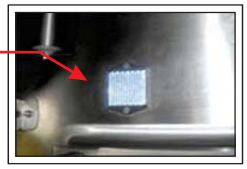
1. GENERAL DESCRIPTION

The Tray Accumulator Conveyor system forms an integral part of the soiled dish table. It is designed to accumulate soiled trays from the cafeteria and deliver them to the dish room for scrapping and sorting. Do not attempt to convey any kitchen equipment such as pots and pans; overloading will seriously damage this unit.

1.1. OPERATION

1.1.1. START UP PROCEDURE

1. Make sure that all the carriers are sitting correctly on the ladders.



2. Make sure nothing is in the way of the photo sensor.

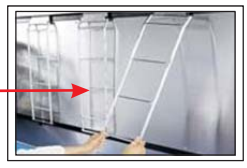
3. Turn the MAIN DISCONNECT switch to the ON position
   Push the green 'START' button & set desired speed.
   Running the conveyor at higher speed may not provide adequate time for loading or unloading.

4. If tray accumulator fails to start after pushing the start button, check for any improperly loaded tray at tray drop. Insert the tray properly to start the TAC.

1.1.2. SHUT DOWN PROCEDURE

1. Reduce speed of conveyor.

2. Press the red stop button and then turn off the main disconnect switch.



3. Clean photo sensor reflector with a soft damp cloth. If the reflector is dirty or scratched it may not operate properly.

4. Carriers & ladders are easily removed for washing when needed.

5. Spray down carriers & ladders to clean. Avoid spraying upward into drive chain housing area.

2.1. MAINTENANCE SCHEDULE

The following maintenance schedule is recommended for trouble-free operation of the Tray Accumulator System.

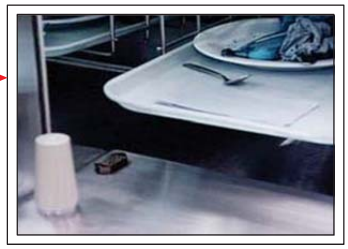
2.1.1. DAILY

1. Hose down the conveyor and conveyor beds to remove foreign material. Never direct the hose to the main control panel or the auxiliary controls or into the chain housing area at the top of the conveyor.

2.1.2 MONTHLY

1. Remove all tray carriers and ladders and wash them

2. Check to make sure that none of the tray carriers or ladders are damaged or missing. If additional parts are required please contact Aerowerks with part and model number.



3. Inspect the photocell to make sure that it is clean and centered. A misaligned photocell will not detect an improperly positioned tray.

2.1.3. SEMI- ANNUALLY

1. Inspect the chain for slack and remove if necessary (see section 2.2).

2. Lubricate the chain & flange bearings that are located on either end of the conveyor.

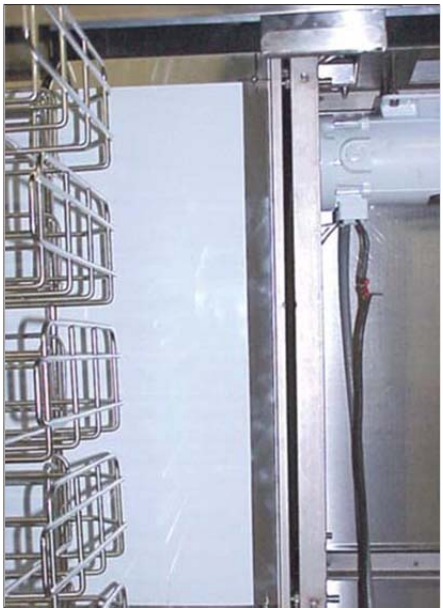
   Inspect the sprockets, shaft and bushings for wear. Replace worn parts.

2.2. CHAIN TAKE UP

The Aerowerks Tray Accumulator Conveyor utilizes only one chain; the drive chain. This chain is located at the top of the tray accumulator unit and moves in a horizontal continuous-loop plane. Generally this chain never needs replacement. However, it is required to remove accumulated stretch in the chain periodically for smooth operation of the equipment. This can be accomplished either by extending the frame for small adjustments or by removing one of the chain links for larger adjustments.

2.2.1. CHAIN TAKE UP FRAME

When a relatively small adjustment is required, (up to 3 inches) the take-up frame needs to be re-positioned. This is accomplished as follows:

	Disconnect the main power to the conveyor and turn off main circuit breaker. Remove the side panels on the drive end of the machine on both sides.
	Locate the chain take-up bolts at the top and bottom on either side.

Adjust all the bolts by turning equally on both sides at each end in order to keep the chain centered and keep the frame aligned.

Before replacing the panels run the system to make sure that the operation is smooth and chain take-up is adequate. Extreme care must be taken during the test run of the equipment when chain is exposed to avoid accidents.

Stop the accumulator and replace all the panels

2.2.2. CHAIN TAKE UP CHAIN-LINK

1. Disconnect the main power to the conveyor and turn off main circuit breaker.

2. Remove the hood panel, curved end panel and both side panels on the drive and the tail end of the machine.

3. Reset the frame take-up bolts (see section 2.2.1) in proper position for future adjustment.

4. Disconnect the chain at the location of the chain link.

5. Please note that there is a certain distance required to be maintained between the 'J' Hooks that are connected to the chain. Never remove more than one chain link between the 'J' Hooks.

6. Reconnect chain links and then run the unit.

7. Make any fine adjustments if necessary.

8. Once adjustments have been made, replace the side covers.

2.3. ELECTRICAL SYSTEM

The electrical system control unit contains all the electrical components required for operation of the conveyor control. There may be auxiliary start-stop stations in addition to the main control panel. Check the schematics for details. The main control panel is NOT waterproof. Under no circumstances should the control panel be hosed down.

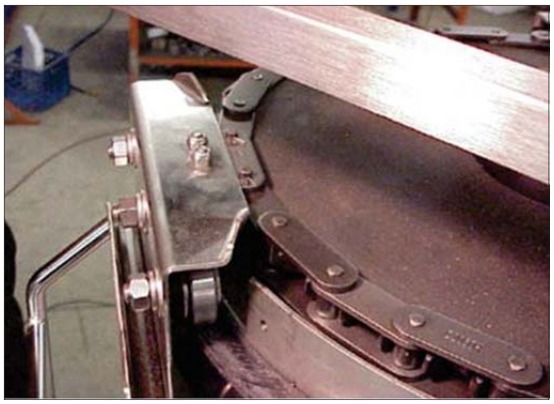
Note: Most Tray Accumulators feature photo sensors with reflectors to detect improperly loaded trays. An improperly loaded tray, or if sensor/ reflector is damaged, the accumulator will not run.

2.4. REPLACING SPROCKETS

Drive/tail sprockets rarely require replacement. If this becomes necessary, check the shaft and bushings for wear at the same time. Follow the steps below when replacing the sprockets.

Disconnect the main power to the conveyor and turn off main circuit breaker.

Remove the hood panel, curved end panel and both side panels on the drive or tail end of the machine.



Disconnect the chain at the location of the chain link. Remove the chain out of the sprocket that needs replacing.

Remove the old sprocket. At this point inspect the shaft and flange bearings for wear and replace if necessary. Insert a new sprocket. Assemble and connect the chain. Adjust the chain take-up if necessary

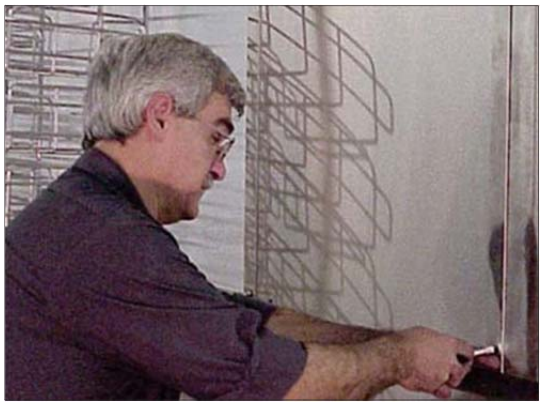
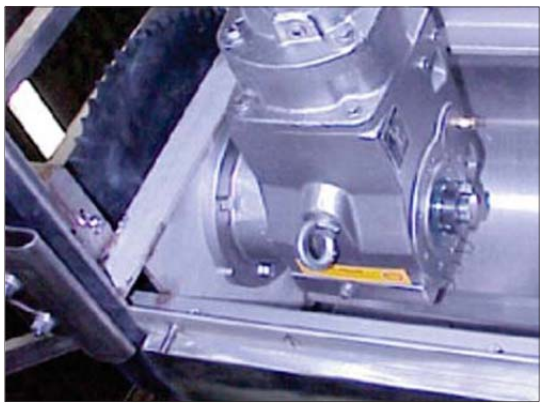
Before replacing the panels run the system to make sure that the operation is smooth and chain take-up is adequate. Extreme care to be taken during the test run with exposed chain

Stop the accumulator and replace all the panels

2.5. REPLACING GEARBOX MOTOR

Before replacing the motor, inspect the electrical connections to ensure that motor is defective. For a spare motor, please contact Aerowerks with the model number and make.

Note: A licensed electrician should perform the service. Follow the steps given below.

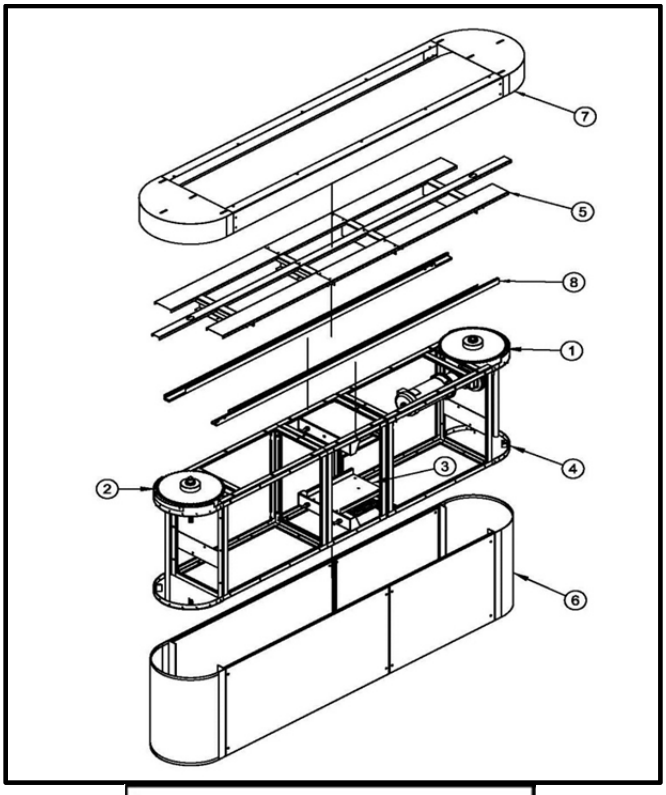
	Disconnect the main power to the conveyor and turn off main circuit breaker. Remove the hood panel, curved end panel and both side panels at the drive end of the machine Remove the key between the drive shaft and the drive sprocket. Remove the drive sprocket and the gear motor
	Replace the new motor and perform the necessary electrical connections. Turn on the power to check the direction of rotation. If the direction is okay replace the drive sprocket and the key Assemble the chain and adjust the motor take-up. Replace covers, and then test run the conveyor

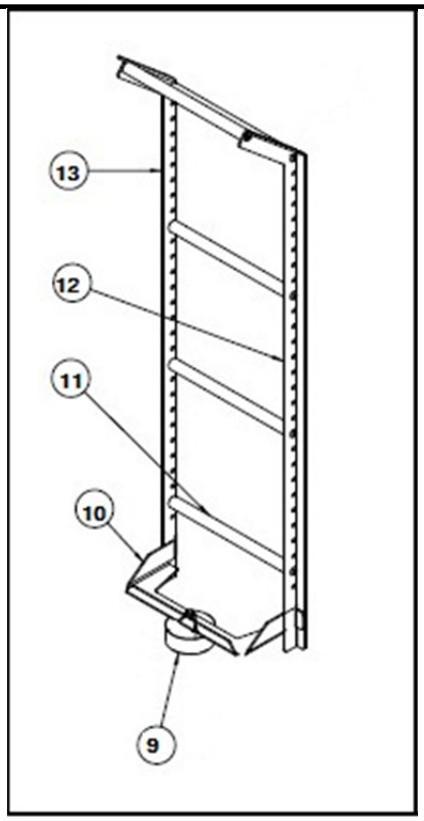
2.6. TROUBLE SHOOTING TRAY ACCUMULATOR CONVEYOR

PROBLEM- MECHANICAL	PROBABLE CAUSE	SOLUTION
Trays seem to “whip” around corners	Tray holders or ladders are not properly mounted. Speed of the conveyor is too high.	Make sure that all tray holders and ladders are properly mounted. Reduce the conveyor speed
Conveyor has stopped abruptly or does not run when start button is pushed.	Some trays might have missed the photocell and stuck between the conveyor and the wall.	Stop the conveyor immediately, shut down power using main disconnects at control panel and inspect conveyor for any jam-ups.
Start button pushed but system does not work	Photocell detector is sensing an object and not allowing system to run. Building power supply is not on. Main power breaker is not on. Main control panel fuses have blown.	Check to make sure that all trays are clear from photocell detector. Make sure the building power supply is on. Check the breaker Replace the blown fuses after first determining the cause. If nothing is seizing or jammed in the track and the problem still persists, refer to the electrical schematics to resolve the problem.

Note: If you continue to experience problems please notify Aerowerks ASAP.

3. TRAY ACCUMULATOR CONVEYOR PARTS LIST EXPLODED VIEW



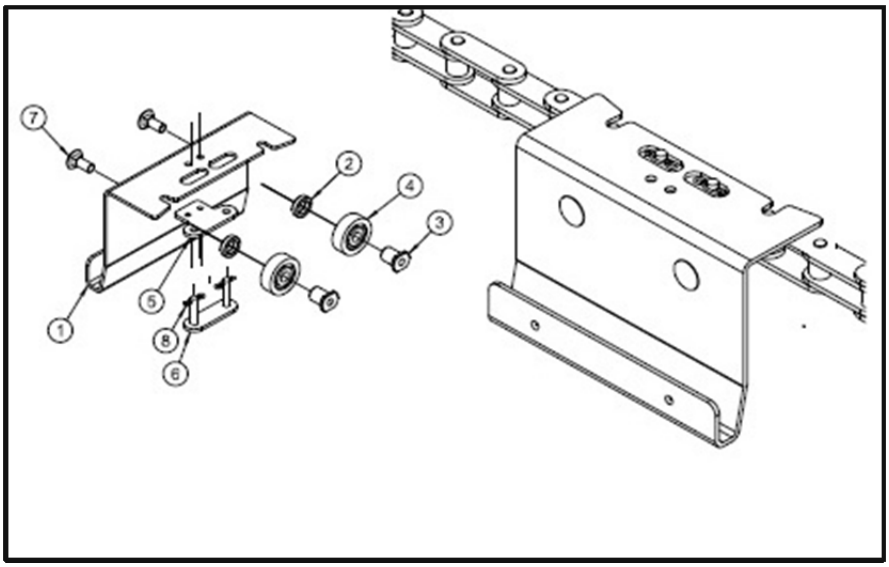


TAC - TRAY ACCUMLATOR PARTS LIST

DWG REF #	PART NO.	DESCRIPTION
TAC 1	0020170A	DRIVE ASSEMBLY
TAC 2	0020150A	TAIL UNIT SPROCKET ASSEMBLY
TAC 3	0022810A	AUTO TAKE UP
TAC 4	0026310A	MAIN FRAME ASSY
TAC 5	0026320A	TA TOP FRAME ASSY
TAC 6	0026330A	TA PANELS ASSY
TAC 7	0026340A	TOP COVER ASSY
TAC 8	0026350	TA CHAIN GUIDE ASSY
TAC 9	0022104	LADDER'S WHEEL
TAC 10	0022303	WHEEL BRACKET
TAC 11	0022304	RUNG W THREAD (1/2"DIA x 6-3/4)
TAC 12	0022302	STRAINGER HOLES 3/4"
TAC 13	0022302	STRAINGER HOLES 3/4"

3.1. J-HOOK

- Remove the carriers from the ladder and ladders from the J-hook to spray off any debris on the body of the tray accumulator.

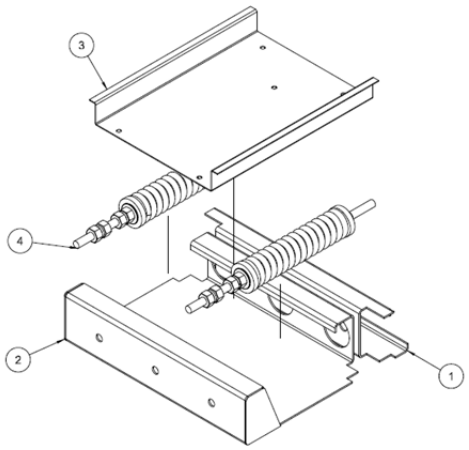


J-HOOK

J-HOOK ASSEMBLY PART LIST

Item Number	Document Number	Title`
1	0022571	J-HOOK (2011)
2	0022572	SS BUSHING
3	0022573	BEARING AXLE (1/2"D x 5/16-18ID x23/32"LG)
4	8102001	BEARING 1621 2RS (1-3/8"D x 3/8"Bore x 7/16"Wide)
5	8117450	ATTACHMENT SA2 (J HOKE PLATE)
6	8117456	CONNECTING LINK C2060H COTTER PIN
7	8300420	CARRIAGE BOLT 5/16"x18 - 3/4"LG
8	8303014	INTERNAL TYPE HAIR PIN COTTER, 0.054 WIRE x 3/4" D.A.

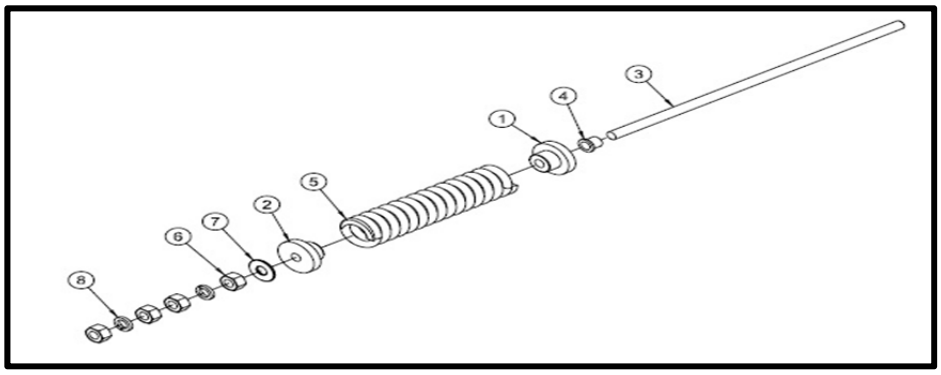
(AUTO TAKE UP ASSY)



(AUTO TAKE UP ASSY PART LIST)

Item Number	Document Number	Title
1	0022811	TRAVLER
2	0022812	PUSHER
3	0022819	SHIPPING CHANNEL
4	0022820	SPRING ASSY

(TAKE UP SPRING)



(SPRING ASSEMBELY PART LIST)

Item Number	Document Number	Title`
1	0022821	SPRING INSERT
2	0022822	SPRING INSERT
3	0022823	SLIDE PIN
4	0022824	NYLON BUSHING
5	8210515	COMPRESSION SPRING 96485K152
6	8302024	#1/2-13 FINISHED HEAVY NUT (HEX)
7	8302206	#1/2 FLAT WASHER
8	8302245	#3/8 SPRING LOCK WASHER

4.

TRAY ELECTRICAL

Aerowerks

ACCUMULATOR MANUAL (TAC)

WARNING

To prevent electrical shock, injuries or even death always disconnect the power before working on our electrical system.

Aerowerks

6625 Millcreek Drive,
Mississauga, ON L5N 5M4
Tel: (905) 363-6999 Ext. 133
Fax: (905) 363-6998
Toll Free: 888-774-1616
Email:electrical@aero-werks.com

Accumulator Electrical Manual

Table of Contents

About

This manual covers the Aerowerks accumulator conveyor electrical system and assist the user to troubleshoot and optimize its performance. The main control panel is **not** waterproof and under no circumstances should the control panel be hosed down with water.

Panel Components

The electrical control panel contains many different electrical components that are used on a case by case basis. These components are DC power supplies, disconnects, fuse blocks, programmable logic controllers (PLC), Variable Frequency Drives (VFD), and relays.

DC Power Supply

The control system of the conveyor operates on 24VDC supplied by a DC power supply unit. It will be protected with 2A or 4A fuses depending on your panel requirements. Always refer to the electrical diagram for further information.

Disconnect

Our disconnect switches are ABB and are rated up to 30A 600V; however the specified voltage for your particular job is located on the nameplate of the control panel and is labeled above the disconnect switch. The majority of our systems will be supplied by a 15A breaker as well. Always refer to the nameplate before connecting power to the panel.

Fuse Blocks

All fuses are sized individually for control or power circuit so it is important to refer to the electrical wiring schematics when replacing fuses. The fuses are class CC and are labeled with the correct fuse size on the fuse block.

VFD

The variable frequency drive (VFD) controls the AC motor speed and current by varying motor input frequency. The VFD's display will show the frequency of the drive when it is running. The VFD is covered in more detail further on in the manual

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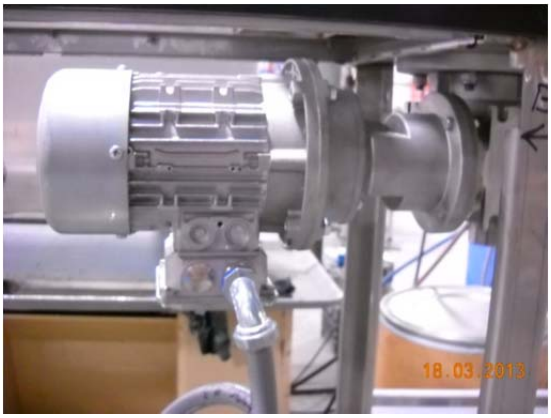
Relay

The relay is used in some cases to replace the PLC or for higher current operations. The relay is 24V controlled and will be either a three or four pole type.

Machine Components



Motor

The drive motor is AC voltage. It is located inside the accumulator where shown on drawings and provides motive power to the drive chain and sprocket assembly.

Anti-Jam Sensor

As shown in the picture above the accumulator conveyor is equipped with an anti-jam sensor designed to stop the conveyor if a tray is improperly loaded (protruding) into the tray carrier. It is very important that the sensor is aligned properly. A mis-aligned sensor will cause nuisance activation. Customers and staff should be made aware that trays must be fully inserted into the carrier shelf. Each accumulator conveyor has two sensors; one at the tray drop area and one on the dishroom side.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Start Button is pushed and conveyor is not running.	System is not getting power	Verify if the main power breaker is on and the system is getting power.
	Conveyor speed is set to 0%	Increase the conveyor speed.
	The anti-jam light is on.	Check the anti-jam sensor for any tray or item blocking it and remove the blockage.
	Excessive mechanical load.	To verify if there is an excessive mechanical load, do the following: open the panel, turn the power on and locate the VFD. (It has a large label on the lower right side of it: "VFD"). Press the start button, check the VFD and if "OCF" is observed on the display then the load is excessive. The entire belt and return track must be checked for any snags or obvious damage. There could also be instances where utensils or foreign objects are lodged in the chain.
	VFD Fault.	To check for a VFD fault, follow the same steps as above. Any error code other than "OCF", as above, indicates a faulty VFD. Contact Aerowerks for a replacement.
	Motor is damaged or not receiving power.	First remove the T1, T2, and T3 wires from the bottom of the red terminal blocks on the problem motor. Ensure the VFD responds correctly by showing an FR 10.0 to FR 55.0 range depending on the speed setting (If not call Aerowerks). Check the wire connections to ensure they are correct. Check the resistance across the T1, T2 and T3 terminals to verify there is no short circuit or open circuit. If it there is either, trace the wire and check its integrity.
	DC power supply is not working.	Check to ensure the "24V O.K." light is on. If the light is on verify with an electrical meter that it is outputting 24VDC. If the light is off then check the fuses and connections supplying the DC power supply.
Anti-jam light will not go off.	Anti-jam is triggered.	Check the anti-jam sensors to ensure that no trays are blocking the reflector.

Auto-rinse will not work properly.	Anti-jam triggers frequently causing random stops. Anti-jam will not reset. Sensor is dirty or scratched. Sensor is damaged or not wired correctly. Loose wire to the solenoid or solenoid is	 The anti-jam will only trip if its sensor is interrupted. It is important to ensure the sensor secured and aligned correctly. The green light should be always on to indicate the sensor is receiving power. If the green light is not on then check the wiring to make sure power is being provided to the sensor. The yellow light will only come on when the sensor is triggered. Check the sensor's lens to ensure it is not dirty or scratched. If it is dirty the sensor should be wiped clean and should work properly. If it is scratched please contact Aerowerks for a replacement. Remove the sensor from the fitting by removing the two Philips screws holding it in place. Flip the sensor over to observe the back of it as shown in the picture. The green light should be always on to indicate the sensor is receiving power. If the green light is not on then check the wiring to make sure power is being provided to the sensor.  The yellow light indicates that the sensor beam has detected an object. The sensor is a proximity sensor that has approximately a three inch activation zone. Pass a hand within the zone so the yellow light operates. If not then the sensor is broken and will need to be replaced. Check the wiring to the solenoid in the plumbing box and ensure the

	damaged.	wires are connected. Check the resistance across the solenoid to make sure there is no open circuit or short circuit. If there is check the wiring to ensure its integrity. If the wiring is ok and the problem persists, contact Aerowerks.
The speed control is not working.	The knob has become loose and is not turning the spindle.	Tighten the screws on the knob to make it tight to the potentiometer spindle.
	The cord has become damaged or loose.	Verify the integrity of the cord to ensure it is not cut or damaged. Check to ensure the connection to the VFD is tight and correct.
	The potentiometer is burned out.	Check the resistance from T1 to T2. The minimum setting should read 5K ohm and the maximum setting 0.1 ohm with a variance in between. The exact opposite effect occurs across T2 and T3. Verify that the measurements are taken from the proper terminal by removing the VFD cover and checking the terminals on the VFD. If these values are not observed the potentiometer may need replacing. Refer to the section below for instruction on replacing the potentiometer.

Replacing the potentiometer

In order to replace the potentiometer the following tools are required:

- Solder gun
- Solder
- Wire cutters
- Channel grips
- New potentiometer (call Aerowerks for replacement 888-774-1616).

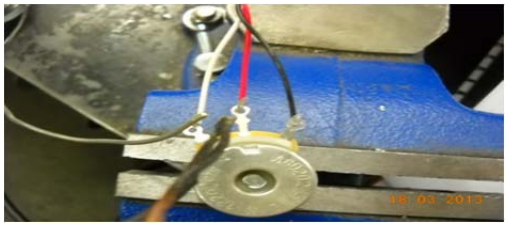
1. Remove the screws from the front of the panel.

2. Loosen the screws on the dial and pull the dial off.

3. Loosen the nut on the potentiometer and pull it off so it can be removed.

4. ** Ensure power is disconnected** Pull the potentiometer out and cut the wires.

5. Strip the wires and solder them on in the following configuration (white, red, black).



6. Ensure the top wires match from left to right (white red, black)

   Reattach everything back to its designated position making sure it is safe electrically. Then the system can be tested to ensure the speed control works as required.

5. Assembly/Installation Of Aerowerks Rotary Tray Accumulator (TAC)

The TAC from Aerowerks is always temporarily assembled and test run in our factory prior to shipping. It is tack-welded together at the field joints (FJ on drawings).
The unit is then disassembled at the field joints and prepared for shipping. On the jobsite, the same joints assist in aligning all sections.
Each section is shipped with legs attached and placed on skids, strapped down and shrink-wrapped.
After arriving at the jobsite, unwrapped and removed from skids the sections need to be delivered to the final destination for assembly. This may involve removing the leg structure. The legs are attached to the sheet metal tabling with leg gussets fitted with set screws.
Once located in the dishroom in the proper orientation the unit should be re-assembled onto its legs and the set screws re-tightened using an allen key.
Due to sloping floors common to dishrooms, the entire structure needs to be levelled to the correct height using the adjustable bullet feet.
Joining the sections together is the next step. Clamp each section at the field joint shown on the drawings, and observe that the joint is smooth and level.

Tack weld at close intervals across the joint, and using a flat hammer and block tap each tack to maintain an exactly level surface across the full length of the joint. Once the two sections are exactly level, the joint is now ready for final welding. Top and bottom surfaces of each joint must be welded for a proper joint.
When all joints are fully welded the welds must be ground smooth and then polished to a number 4 finish. When complete, the joint must be invisible.
It is now time to mount the superstructure of the accumulator to the table. It is bolted in place using pre-drilled holes.
The chain take-up section is ***not*** bolted to the table but hangs free, so that the upper and lower springs can apply constant tension on the conveyor drive chain. *Note: The take-up frame is shipped with an upper and lower "hold-in-place" plate. These must be removed at this time.*

Installing the upper drive chain.

After the chain has been threaded into its retainer track, mount the ladder brackets at each hanger location on the chain. The upper horizontal bar of the ladder is inserted into the “J”-bracket which has built-in dimples to retain the ladder in place. Be sure to snug the bracket into place with a strong downward pull. It will snap into place.
With the ladders in place the wire tray carriers are mounted onto each horizontal bar of the ladder by simply hooking over the bar. Again, a downward force will snap the carrier onto its ladder bracket.
Connect the motor electrically from the rough-in point and follow the start-up procedure in the operating instructions.

DROP AREA LED LIGHTING

- LED Lights are installed on top of the sound baffle and powered from Aerowerks control panel.
- The LED light are rated for 24VDC only.
- There is no separate switch for the LED lights, As soon as turn on the main disconnect the Led lights will turn on.
- The tray drop area opening between 4’-7’ -One LED light.
- The tray drop area opening more than 8’-two LED lights.
- The LED length 1000mm, Natural White Unit 4000K and 11W.

6. WARRANTY:

AEROWERKS INC. LIMITED WARRANTY, SERVICE & PARTS POLICY

5.1 WARRANTY PERIOD

Aerowerks warrants its products to the original purchaser against any defects in material and workmanship, under normal use and service for a period of one year after the date of installation. Such installation must be performed by Aerowerks personnel or an Aerowerks authorized agent.

5.2 GENERAL

Aerowerks will not cover for damage to electrical/mechanical equipment on conveyors due to power surges, water damage (due to building plumbing leaks or improper equipment maintenance) & electrical overloads.

Aerowerks is not liable for damage caused by faulty installation, mechanical or electrical failure caused by unauthorized alteration, misuse or abuse of the equipment.

Liability or obligation in connection with the products of Aerowerks is limited to the products covered in this warranty.

This warranty is exclusive and in lieu of any other warranty, either written or oral and whether express or implied.

This warranty is limited to the United States and Canada.

In no event shall Aerowerks be liable for incidental, indirect or consequential damage whether caused by use, misuse, or defects in the product.

5.3 CUSTOMER RESPONSIBILITY

In addition to complying with all suggested maintenance guidelines and instructions, owner's obligation shall include but not be limited to: operating the equipment in accordance with the owner's manual or any other additional instructions given at time of installation or in subsequent communications provided by Aerowerks or its authorized agent.

The owner shall exhibit reasonable care in the use, operation, maintenance and general upkeep of the equipment.

Failure to comply with these requirements will void any applicable warranty.

5.4 HOW TO HANDLE A WARRANTY CALL

Please contact Aerowerks Customer Support Staff at **1-888-774-1616 ext. 0** for all concerns regarding Aerowerks equipment. Hours of operation are 8:00 am to 4:30 pm EST.

Do not contact Hobart Service: Hobart Service is our authorized service agent and will only perform warranty service with a valid purchase order and authorization from Aerowerks. Contacting us directly will speed up the process of your warranty concern to minimize downtime. If you require after hours emergency service then call Hobart Service. In the event that Hobart Service has scheduled a service call without prior notification to Aerowerks they must notify Aerowerks and request a valid purchase order from Aerowerks during our normal business hours before invoicing Aerowerks.

6.5 Tray Accumulator Conveyor

The following items are not covered under this warranty:

Normal wear on parts including sprockets, shafts, bushings, rail /chain guides, rollers and equipment damage due to power surges or electrical overloads are not covered under warranty. It is important that you do not operate your system with broken or damaged parts. If you notice extreme wear please contact Aerowerks.

Conveyor Jams: Conveyor jams due to improper insertion of the trays in the carrier basket will not be covered under warranty. It is important to train your staff on proper operation and clean-up procedure.

Anti-Jam Photo Sensor: The anti-jam photo sensor is a very sensitive part and should never be hosed down with water. It is pre-set by our factory to operate according to the programming in the control panel and is not user-serviceable. If the sensor is malfunctioning, it must be replaced immediately; contact Aerowerks.