

REFRIGERATION TROUBLE SHOOTING
(USE ONLY QUALIFIED REFRIGERATION REPAIR SERVICE)

PROBLEM	PROBABLE CAUSE	SYMPTOMS	REMEDY
Compressor will not start or try to run.	Power failure due to blown fuse, open circuit breaker or open disconnect switch or service switch.	Electrical circuit test shows no power on line side of start relay.	Replace fuse, check load on fuse. Determine why circuit breaker or disconnect switch open. If no reason, close breaker or switch.
	Defective start relay	Test for burned out or open holding coil and broken contacts	Repair or replace
	Open control circuit	Start relay coil not energized	Check pressure switch (on 3 H.P. and up) reset switch. Check reason for either too low or too high pressure.
	Defective compressor	Compressor will not run	Replace defective compressor.
	Low voltage	Electrical circuit tester glows but not at full brilliance, wiggley moves but not up to proper voltage	Check with volt meter, if low check internal power power source, loose connections etc. Call power company.
	Low oil pressure	Compressor will restart upon resetting oil pressure switch	Check oil level, add oil if necessary, check pressure control and wiring.

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Condensator starts and stops with machine heat on	Dirty condensing coil	Condensator shuts off on overload	Clean condensing coil (vacuum, do not brush dirt in).
	Condensator fan defective	High head pressure shuts off on overload or pressure switch (if furnished).	Replace defective fan.
	Defective run or start capacitor	Humming on start-up. Frequent start-stops.	Replace defective capacitor.
	Defective start relay		Replace defective start relay.
	Low oil pressure	Compressor will restart upon resetting oil pressure switch (if furnished)	Check oil level, add oil if necessary, check control and wiring, replace control if necessary.
Cooling coils frosting (Normal for chlorinated solvents and low ambient conditions with fluorinated solvents)	R.T. thermostat set too low	Frosting and ice on cooling coils	Reset R.T. thermostat to 45° F. Recalibrate if necessary.
Insufficient cooling with heat "ON"	Dirty condensing coils or obstructed air flow over	Unit heat shuts off on safety vapor thermostat	Clean condensing coil. Clear air flow over condensator.
	System low on refrigerant	Bubbles in system sight glass	Repair leak and charge system.

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Insufficient cooling	Restricted line strainer, dryer or expansion valve	Temperature change in line after restriction (frosting).* Unit heat shuts off on safety vapor thermostat	Replace restricted part or adjust expansion valve (if adjustable) to proper super heat setting 8°/ 12° F.
	High ambient temperature room temperature too high to remove enough heat from condensing coil.	Same as above	Do not operate equipment until ambient temperature drops.
Compressor noisy when starting	Check hold down bolts	Noise from condensor	Spring mounted compressors, loosen hold down bolts. Check 1/2 H.P. condensing unit base bolts, if too long, shorten.
	Liquid returning to compressor	Noisy on start-up	Check R.T. thermostat bulb location, if not on <u>bottom</u> of bottom coil and tight, relocate and tighten.

* NOTE: Frosting at suction accumulator is normal.

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PROBLEM	PROBABLE CAUSE	REMEDY
Strong solvent odor around degreaser (also see high vapor concentration below).	Cover open.	Keep machine cover closed except when putting parts into, taking parts out of or hand spraying in degreaser.
	Drafts over open top degreasers cause vapor to be disturbed.	Remove fans, air make-up units, etc. from degreaser area where they can cause air currents over open top degreasers.
Air make-up unit and gas fired space heater corrosion.	Drafts over degreaser pulling out solvent vapors, solvent vapors decomposing and corroding units.	It may be necessary to put up partitions to block air currents over open top degreasers. Space heaters require special flue gas venting.
High vapor concentration around machine high solvent usage (also see solvent odor above).	Exhaust system not operating.	Exhaust system should be interlocked with degreaser heat. No exhaust, no heat.
	Exhaust duct blocked or damper not adjusted properly.	Remove duct blockage, readjust damper for proper air flow.
	Lip slot(s) closed or not adjusted properly.	Open lip slot(s) and adjust for even air flow along entire slot.
	Work being processed too fast through machine.	Reduce speed - never exceed eleven (11) feet per minute vertical travel. Wait until parts (work) looks dry before removing from machine.
	Parts (work) cupping (holding) solvent because of part configuration.	Proper part orientation for complete drainage. Tilt or rotate parts to promote draining.

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High vapor concentration around machine high solvent usage.	Parts cupping solvent.	Tumble parts in vapor to spill out solvent before they are removed from degreaser. (Use rotating basket conveyORIZED machine or rotary plating basket that can withstand solvent). If none of above solve the problem, process may require drying tunnel or section with a carbon adsorption system. Check with Ultronix, Inc. sales engineer or factory.
	Too high spray pressure or spraying at or above vapor line.	Reduce spray pressure. Do not spray at or just below vapor line. Spray as far below vapor line s possible. See instructions or degreaser assembly print for vapor line location.
	Too large or heavy loads. Vapor line drops with load and takes 5 minutes or more to recover (return to proper level). This pumps a vapor air mixture from machine when vapor line recovers.	Reduce weight or surface area per load to reduce heat requirement.

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PROBLEM	PROBABLE CAUSE	REMEDY
High vapor concentration around machine. High solvent usage.	Solvent leakage or spills.	<p>Use all safety precautions. Evacuate area if necessary. Be sure to notify proper agencies of any reportable release. Correct or repair leaks, clean up any pools of liquid solvent.</p> <p>Air out area. Check for safe working conditions before resuming production.</p> <p>Always tighten cleanout door gaskets from center out to edges. Use a teflon or teflon filled pipe compound when making up joints in solvent piping. Never use galvanized pipe for solvent.</p> <p>Do not use aluminum or any white metal for pumps, fittings or piping.</p>
Parts not degreasing properly	<p>Solvent not up to proper temperature, vapor line too low.</p> <p>Solvent too contaminated. High boiling point, 9° F. or higher above fresh solvent boiling point. Very little solvent vapor being condensed on cooling coils. Very little condensed solvent coming from still.</p>	<p>Wait until solvent is condensing on cooling coils before processing work.</p> <p>Boil down boiling or vapor sump (see instructions or degreaser assembly print). Do not expose heating surfaces. Drain boil sump. If boil sump has solids, metal fines, etc. drain entire machine (if degreaser has more than one sump). Using all safety precautions clean out machine and refill with fresh degreasing grade solvent.</p>

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Parts not degreasing properly	Improper cleaning cycle. Parts wet when removed from degreaser. Too fast a cycle.	Increase immersion or time in vapor spray and let dry before removing. Lengthen time and/or immersion in degreaser. Check with Ultronix, Inc. or cleaning solvent representative for proper cleaning process for parts.
	Temperature of ultrasonic sump too high - solvent boiling (units with heater/cooler package).	Set heater/cooler thermostat lower - if thermostat non-functional - replace thermostat. See ultrasonic section of manual for proper cavitating temperature of solvent being used.
	No recirculation of heater/cooler package, too much particulate matter in ultrasonic sump.	Replace filter cartridge recirculation system.
	Too much recirculation tends to upset proper ultrasonic operation.	Partially close valve on discharge side of recirculation pump.
Parts not degreasing properly	Adjustable power control turned down. No ultrasonic activity in sump.	Turn up adjustable power control. Turn up slowly and check parts being processed.
	Ultrasonic sump not degassed. Ultrasonic sump must be degassed before proper cavitation for parts cleaning.	Bring sump up to temperature. Turn on ultrasonic generators. Set half/full wave switch to full. Wait for high pitch sound and until ultrasonic sump surfaces is peaking with ultrasonic cavitation.

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PROBLEM	PROBABLE CAUSE	REMEDY
Ultrasonic generator not working		See trouble shooting in ultrasonic section of manual.
Spray pump not pumping solvent. No solvent coming out of spray wand.	Spray reservoir empty.	Reduce amount of spraying. Spraying too much for solvent being condensed.
	Not enough solvent being condensed.	Check boiling point of solvent. Maybe too much contamination for proper vapor generation. Drain and replace with fresh solvent.
	Condensed solvent overflowing trough back into boil sump.	Clean piping from trough to separator, clean separator and piping to spray reservoir.
	Spray filter/strainer clogged.	Replace cartridge filters/clean strainers.
	Metal fines in spray pump (especially magnetic drive pump).	Remove metal fins, provide strainer before pump or replace pump with direct drive pump.
Spray pump will not start	Vapor up thermostat not sensing vapor. Vapor up light not illuminated.	Machine heat must be on and vapor at proper level to start spray pump.
	Vapor up thermostat out of adjustment.	Re-adjust vapor up thermostat. (Calibrate thermostat if necessary, see instruction sheet).
	Vapor up thermostat not functioning.	Replace vapor up thermostat.

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PROBLEM	PROBABLE CAUSE	REMEDY
Spray pump works fine until solvent (n-Propyl Bromide or Trichlorethylene) is hot when it is pumped.	Magnetic drive spray pump. Shaft pin on high side of tolerance and impeller I.D. on low side of tolerance.	Enlarge impeller I.D. slightly or reduce shaft pin O.D.
Spray pump leaking solvent	Shaft seal bad. Front end plate loose (Suction and discharge plate).	Replace shaft seal(s). Tighten end plate.
Spray pump on no spray or uneven spray	Spray nozzle(s) clogged or partially clogged.	Clean spray nozzle(s) if spray headers located in machine - observe all safety precautions - drain and air out machine if necessary.
Heat shuts off because of high temperature control or low level control	Liquid level too low in boil sump.	Add fresh degreasing grade solvent until proper level is reached in boil sump. See degreaser assembly print.
Heat shuts off because of liquid temperature control.	Too much alcohol in boil sump when using fluorinated solvent mixes. Maximum setting 130° F.	Drain boil sump and fill with fresh solvent through spray reservoir. Dispose of drained solvent properly.
	Too much oil in chlorinated solvent. 9° to 10° F. above fresh solvent boiling point.	Same as above.
Heat shuts off because of high temperature control	Metal fines, lint, etc. collecting around thermostat capillary bulb.	Drain sump clean material away from capillary bulb and all solids from sump. Observe <u>all</u> safety precautions when cleaning out boil sump.

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PROBLEM	PROBABLE CAUSE	REMEDY
Electric heating element burnt out	High contamination in boil sump or still. Too many solids, oil, etc.	Drain machine, pull clean out door, clean or replace heating element(s). Observe all safety precautions.
Solvent takes a long time to heat up.	Boiling point 9° F. or higher than fresh solvent.	Clean out sump. Observe all safety precautions when cleaning out machine.
Distillate flow sight shows very little flow		Refill with fresh degreasing grade solvent.
Parts, especially aluminum parts, discoloring. Toxic fumes sharp pungent odors. Corrosion on cooling coils, discolored tank interior. Conveyor rusting.	Acidic solvent too much aluminum or white metal fines in solvent. Too much water getting into solvent (inhibitors immersible in water).	Stop production. Check pH of solvent. Check acid acceptance of solvent. If solvent acidic, see instructions for cleaning acid degreaser - observe all safety precautions.
Heat shuts off because of safety vapor control or water flow switch.	Cooling water not on.	Turn on cooling water. Re-set safety vapor control.
	Temperature control valve not properly adjusted (do not use with cooling tower water).	Readjust water temperature control valve. Check strainer to see if it is blocked.
	Cooling water piping and/or coil blocked or limed up.	Clean cooling water piping and coil. Boiler service people can clean out water lines. Reset safety vapor control.

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PROBLEM	PROBABLE CAUSE	REMEDY
Safety vapor control shuts off heat	Cooling water temperature too high.	<p>Check chiller if chilled water used for cooling.</p> <p>Clean air filters or repair for proper temperatures.</p> <p>Check cooling tower system if tower water used. Especially return piping for proper flow. Reset safety vapor control.</p>
	Not proper temperature setting.	Calibrate per instruction sheet. It may be necessary to set a little higher to prevent nuisance shut downs.
Safety vapor control shuts off heat	Safety vapor control not functioning.	Replace safety vapor control.
<u>*Check Proper Operation of Safety Vapor Control Weekly*</u>		
Machine heat stays on and vapors come out of machine	Heat solenoid valve(s) stuck open.	Evacuate personnel from area - observe all safety precautions. Turn off heat to degreaser manually.
	Heat contactor(s) stuck closed.	Turn off main line disconnect (unless degreaser does not have electric heat and exhaust is required for breathable atmosphere).
	Safety vapor control not functioning.	Check for proper setting and calibration. Replace if necessary.

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PROBLEM	PROBABLE CAUSE	REMEDY
Machine heat or control circuit will not energize.	Main line disconnect off.	Turn on main line disconnect.
	Fuse(s) blown.	Check fuse(s), find reason for fuse(s) blowing, repair, then replace fuse(s) with proper size.
	Control transformer not functioning.	Replace control transformer.
	Not functioning pilot light(s), push button(s), or switch(es).	Replace not functioning pilot light(s), push button(s), or switch(es).
Machine heat will not come on	Exhaust system not on.	Turn on exhaust system.
	Low liquid level.	Add fresh degreasing grade solvent to spray reservoir or distillate tank until level in boil sump up to proper level.
Safety vapor, high temperature or liquid temperature control tripped	Low cooling, dirty boil sump, contaminated or too high boil point of solvent.	Correct condition, reset control.

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PROBLEM	PROBABLE CAUSE	REMEDY
<p>Conveyor drive starts but chains or belt does not move.</p>	<p>Torque limiter slipping.</p>	<p>Check for obstructions to conveyor movement, parts spilled into sumps, open cover on rotating fixtures or baskets. If necessary drain machine, observe all safety precautions. Clean out spilled parts, close covers, repair any damage. Replace shear pin - restart conveyor - or if necessary tighten torque limiter. Caution: Do Not over tighten, adjust in quarter turn increments and try drive.</p> <p>Refill machine.</p>
<p>Conveyor drive starts but chains or belt does not move.</p>	<p>Cross rods not aligned.</p>	<p>Check chain take ups - take up evenly and if necessary, jump tooth on drive sprocket to align crossrods - replace shear pin or adjust torque limiter if required.</p>
	<p>Excessively rusted conveyor chain.</p>	<p>Lubricate chain.</p>
	<p>Sprocket(s) worn or damaged.</p>	<p>Replace worn or damaged sprocket(s). Look for uneven loading, misalignment or improper adjustment. Check chain for wear.</p>

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Conveyor drive motor trips overloads	Torque limiter adjusted too tight.	Adjust torque limiter to drive conveyor with normal loads. Replace friction discs if necessary. Do not over tighten.
	Shear pin replaced with straight pin.	Replace with proper shear pin. Remove cause of overload. Reset drive motor overloads.
Ghost vapor (foggy-white) in degreaser or still	Excess water in solvent.	Check water separator - be sure solvent is flowing through separator and water outlet on separator is free.
Thermometer shows temperature of solvent to be below normal boiling point and solvent is boiling	Clogged piping.	Check for clogged pipes to or from water separator.
	Water and solvent can form an azeotrope with lower boiling point.	Free pipe lines for full flow. Drain excess water from separator through water purge valve.
	Cooling water coils leaking.	Repair or replace cooling coils.
If steam heated; decrease rate of boil even though steam pressure is up.	Leaking steam coils. <u>THIS CAN BE HAZARDOUS.</u>	Shut off boiler, evacuate boiler and degreaser areas.

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PROBLEM	PROBABLE CAUSE	REMEDY
Blow down of boiler has solvent odor	<p>Boiler water is treated. Sodium hydroxide is a form of water treatment. When sodium hydroxide, solvent, water and high temperatures exist, dichloroacetylene gas lines can form.</p> <p><u>Dichloroacetylene gas will automatically ignite when mixed with air.</u></p>	<p>SLOWLY drain boiler, while bringing in raw water, so that air will not enter boiler. Flush all steam piping, steam coils, and condensate with raw water from boiler.</p> <p>Drain solvent, check for pH and acid acceptance. Dispose of solvent properly if solvent cannot be reclaimed.</p>

WHEN WORKING ON OR NEAR DEGREASING EQUIPMENT, NEVER USE OPEN FLAMES OR ARCS (SUCH AS WELDING) WHEN SOLVENT IS PRESENT IN DEGREASER. ALWAYS DRAIN DEGREASER AND THOROUGHLY AIR OUT AREA BEFORE ATTEMPTING ANY WELDING AND OR WORK WITH TORCHES. SOME SOLVENT VAPOR AIR CONCENTRATIONS CAN BE IGNITED.