



Technical Publications Department

Technical Bulletin Index

The following is a complete listing of the Technical Bulletins issued by Akrion Systems.

#	Issued	Subject/ Key Words	Issue	Expires
1	10/09/02	Gateway Computers, Reptron Computer Upgrade, Scrapped Wafers	GAMA Systems Running Software Version 5.06 or Higher on Computers Other Than Akrion Systems Reptron 586/166 MHz may experience operating glitches that can result in scrapped wafers.	10/09/03
2	10/09/02	Fortrend Wafer Transfer Units, Coated Composite Carriers, Omega Plus Carriers	Due to differences in the end plate design of Halar and coated quartz carriers, 200 mm Fortrend Wafer Transfer Units originally issued with Halar carriers that now are used with coated quartz carriers will no longer sense the presense of wafers.	10/09/03
3	10/09/02	Iwaki Chemical Injection Metering Pump, N2 Purge Line	Premature failure of the Iwaki metering pump used on modules equipped with chemical injection systems. Failure is due to chemical fumes migrating inside the pump's electronic control module. Internal components corrode and the pump eventually fails	10/09/03
4	10/09/02	LuCID Dryer, Piston/Cylinder Assembly, Plastic End Cap Deterioration	Chemical degradation of cylinder end caps of the Akrion Systems LuCID dryer lid. Over time chemical fumes may dissolve the plastic end caps. If the chemical enters the piston/cylinder assembly, the piston may fail.	10/09/03



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5	10/09/02	LuCID Dryer, Lid Failure, Cylinder Base Brackets	On Akrion Systems LuCID dryers there have been occurrences of the "cylinder base bracket" (lower lid piston mounts) becoming loose. If one piston fails during a lift operation, the lid open sensor is opened at the time the scheduler polls the sensor and the move is committed. If the lid falls closed due to a piston failure - the scheduled move is not interruptible and the result is a robot crash into the lid.	10/09/03
6	10/09/02	LuCID Dryer, Particulate Problems, N2 Filter Kit,	On Akrion Systems LuCID dryers there have been occurrences of particulates in the N2 delivery line to the anti-static emitters.	10/09/03
7	10/09/02	GAMA Robot, GAMA Robot Ball Screw, vibration	The transfer robot ball screw is a wear item. It may operate for many years before replacement becomes necessary and no set replacement interval is needed. PM neglect of lead screw cleaning and bearing greasing will accelerate wear.	10/09/03
8	10/09/02	Coated Composite Carriers, Old Style End Effector Fingers, Uneven Carrier Travel	The old style pick up finger on coated composite carriers used on GAMA wet station does not hold the carrier securely during operation. End effector may become damaged.	10/09/03
9	10/09/02	Valves may leak prematurely in high concentration 37% HCL /Chemical dispense valves/Pre weigh Deck top valves.	Saint-Gobain Performance Plastics: Furon UPM-1000 series valves may fail prematurely when exposed to high concentrations of HCL at or above 37%. A safety risk exists typically during maintenance activities when valves are presumed closed but remain open.	10/09/03
10	10/09/02	CANCELLED – PULL FROM CIRCULATION GAMA Electrical Tower DMC, External Robot DMC Control Boxes, Incorrect Robot DMC Controller Part Numbers REFER TO TB 11	CANCELLED – PULL FROM CIRCULATION The Akrion Systems part numbers for the robot vertical and horizontal DMC controllers were inadvertently switched on earlier revisions of electrical towers and DMC box drawings. REFER TO TB 11	CANCELLED 12/20/02
11	12/20/02	GAMA Electrical Tower DMC, External Robot DMC Control Boxes, Incorrect Robot DMC Controller Part Numbers	The Akrion Systems part numbers for the robot vertical and horizontal DMC controllers were inadvertently switched on earlier revisions of electrical towers and DMC box drawings.	12/20/03



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12	02/17/03	LUCID, Hot UPN2 Braided Hose, Black Residue, Worn Jacket, UPN2 Leak	Stainless Steel Braided Hot UPN2 lines (qty 2), which feed the lid drying bars/nozzles, may wear and breach. This may impact MTBF and process results. MANDATORY REPLACEMENT of hot N2 “convoluted” jacketed hose assemblies with correct “corrugated” jacketed version.	02/17/04
13	04/23/03	Lucid, Particle Generation, Lid Hinge Clevis, Machine/Rework	Lucid lid hinges may have interference fit resulting in particle generation. Machining can eliminate problem.	04/23/04
14	04/23/03	DMC1 Robot Controller, DMC2 Robot Controller, Robot Reset Problems	When DMC1 and DMC2 controllers are used on same robot, resetting the robot using bench software may be a problem due to timing differences between the two DMCs. When replacing a DMC1 controller with a DMC2 controller, both the horizontal and vertical DMC2 controllers must be installed to ensure reset compatibility.	04/23/04
15	07/02/03	DMC 1 & 2 programming/service cable, RS232 cable, Robot	The DMC RS232 calibration cable (CAB001677) necessary to calibrate and service both DMC1 and DMC2 robot controllers is not included with the purchase of a DMC2 controller. The calibration cable is considered a “tool” that must be purchased separately. Installation or service of robot controllers by either customers or Akrion Systems personnel is often delayed until a cable is attained.	07/02/04
16	07/02/03	Uninterrupted Power Supply (UPS) replacement, upgrade, compatibility, retrofit, spare parts	For various reasons, UPS OEM suppliers and models have changed many times with the evolution of the GAMA and Rear mount electrical control towers. Physical size and wiring needs have changed for most UPS applications. The need for a replacement UPS is often urgent and requires special attention to detail when requesting replacements. In some cases, engineering changes may not have kept pace with Parts Logistics for spares replacement parts on older obsolete UPS systems. Direct replacement of obsolete UPSs may not have identified parts/kits.	07/02/04
17	07/02/03	LuCID N2 dry bar manifold end block hardware, particle prevention.	The original stainless steel hardware (bolts, nuts and washers) used to secure the hot N2 dry bar manifold end blocks to the dryer lid may corrode due to chemical dragout into the dryer that can occur during processing or hard-cleaning.	07/02/04



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18	07/17/03	Lid actuator cylinder, series 3 solvent tank auto-lid, seal leaks, PM requirement	Stainless steel lid actuator cylinders (205805-001) on Series 3 solvent process tank auto-lids (202951-001 and 215482-001) are a wear item that requires periodic inspection and replacement to prevent lid operation malfunctions.	07/17/04
19	08/21/03	LuCID Clean Point Unit (CPU) de-ionized water (DIW) filter elements	Akrion Systems now recommends a Clean Point Unit inlet filter element pore size of .01um and a CPU outlet filter element pore size of .04um. This larger to smaller pore size in the liquid flow path will improve the filtration efficiency that is lacking in the original OEM design. In addition, the .04um outlet filter has been upgraded to a Posidyne "Plus" filter element. The Akrion Systems part number of the .04um Posidyne "Plus" filter is 215143-001 (rev B).	08/21/04
20	08/21/03	OBSOLETE PART NOTICE, REPLACEMENT PART/UPGRADE ICE-1™ Control Module, Conductivity Transmitter	Akrion Systems ICE-1™ Control modules (part numbers SNS1A0030, SNS1A0029, SNS1A0031, and 211249-001) are no longer available. The drop-in replacement for these obsolete analog only modules is the next generation Akrion Systems ICE-1™ Control Module, (part number 218422-001).	08/21/04
21	08/21/03	Shuttle lift popup queue indicator lamps / lights	Shuttle and lift/pop-up queue position incandescent indicator lamps (green – shuttle locked, red - shuttle down) were prone to premature failure due to shuttles being slammed in and out.	08/21/04
22	08/26/03	Low temperature filter housing mounting bracket upgrade kit	All low temperature single and dual filter housing assemblies are mounted with four screws per bowl - affixed to a tapped mounting plate that is welded to a plenum side-wall supporting bracket. Reported field data has shown that some, not 100%, of the filter housing mounting plate-to-bracket welds have cracked.	08/26/04
23	08/28/03	Process Technology wire size increase – wire containment and feed through kit required for installation of new heaters.	Process Technology (PT), in-line quartz heater OEM, has increased the buss supply wire from 10 gauge to 8 gauge for both the 8 kW (207433-001) and 4.5 kW (207433-002) heaters. Plenum feed through holes/fittings sized for 10 gauge wire are too small for 8 gauge power wires.	08/28/04



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24	09/02/03	Mini environment door request latch mechanism may not pop open/ajar door	Mini environments (ME) equipped with a door latch (interlock) feature may not pop the door open/ajar when the door request button is pressed. If the door is not manually opened in several seconds, the door request open time expires, and problems can occur.	09/02/04
25	09/03/03	Validate computer and card part numbers via current BOM in Visibility, not card placement drawings or outdated materials lists or drawings	Drawings are no longer produced or maintained for computer card parts identification or board placement. Many benches supplied with NT computers were issued Blueprints manuals having an outdated reference drawing such as COM009785 to show card placement. The materials list is not the BOM of the fully loaded NT computer. Ordering parts from any document other than the latest fully loaded computer BOM specific to a bench, may lead to the inaccurate ordering and supply of parts.	09/03/04
26	09/09/03	Quartz in-line heater flow direction must be correct to prevent quartz chamber from breaching and resultant chemical leaks.	An improperly plumbed, reverse flow, quartz in-line heater will trap gasses within the quartz chamber, and accelerate the etching of the quartz. The quartz will leak, activate the heater leak capacitive sensor and irreparably damage the heater.	09/09/04
27	09/10/03	Akrion Systems AT and AP series pump rebuild kits include shuttle end caps for annual PM replacement.	Ceramic shuttles which have top and bottom elbow fittings, may stall after one year of continued use due to normal wear and tear.	09/10/04
28	09/11/03	Loose main power connections may result in equipment failures	Loose hex-lug power bus connections on the main power feed wires (L1, L2, and L3) and input/output lugged connections of both the main circuit breaker CB1 and main contactor K100, have been isolated as sources for voltage anomalies which have led to component failures in the main power branch circuits.	09/11/04
29	09/12/03	DMC2 robot failures: reset issues, over current, shaking or vibration	DMC2 servo drives are factory programmed for use with specific servo motor types from different manufacturer sources. Commonly named M406D or S32, the different motor types require specific DMC2 configuration programming files to match the motor type to the servo drive setup. Mixing the wrong motor types with the wrong DMC2 program type will result in undesirable robot operation and failures.	09/11/04



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30	10/06/03	Preventing NT Computer Hardware Failures Due to CPU Cooling Fan Problems	On computers shipped prior to 11/01/30, CPU cooling fans are secured to the computer motherboard using a clip. This clip can become loose or dislodged during shipment, impairing the fan's ability to cool the CPU.	10/06/04
31	10/06/03	Computer Anti-virus programs: setup and use on Akrion Systems equipment	Computer viruses can affect the performance or stability of the Akrion Systems Software and damage computer hardware systems.	10/06/04
32	11/03/03	Requesting customer originated documentation changes.	Equipment modifications performed in the field that have not been provided through a documented Product Enhancement, cannot be supported reliably from the factory when asking for trouble shooting and/or parts logistics assistance.	11/03/04
33	11/03/03	Robot and Queue Product Sensor Relay Wiring Change	Relay vendor supplied a new relay for this associated part number with a different pin configuration. These changes have not been incorporated into the drawings and have caused confusion in the field.	11/03/04
34	11/12/03	GAMA Plenum Door Latches & Handles	Plenum door latches and handles may wear/break over time. The latches and handles have been redesigned and are available as a purchasable kit	11/12/04
35	01/07/04	LuCID Dryer MFC Failure Interim Fix	Failure of a Mass Flow Controllers (MFC) can result in a "Bench Down" condition until a new MFC can be installed.	01/07/05
36	01/30/04	Over Processing Product, Potential Product Loss, Critical Tanks	If the "overprocess time" parameter of any critical tank in a recipe is set to a value above zero, and multiple lots are running, the potential exists for processing beyond this set "overprocess time". Product loss is possible if this occurs. This is a very intermittent problem and not all customers that utilize the "overprocess time" recipe parameter will experience this problem.	01/30/05
37	02/01/04	Single and Dual Column DI Water Heaters, Solid State Relay (SSR) Replacement Kits, Obsolete First Generation SSR	New Solid State Relay Kits must now be used to replace/upgrade Single of Double Column DI Water Heater electrical systems. The first generation SSRs used to upgrade mercury relays are now obsolete.	02/01/05



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38	02/01/04	Single and Double Column DI Water Heater, Spare Parts, Second Generation Solid State Relays, CC8-c Comparator Boards	Replacement spares parts are needed to service Single and Double Column DI Water Heater equipped with second generation solid state relays and CC8-c Comparator Boards	02/01/05
39	04/06/04	AKS Internal Computer UPS, Battery Packs and Batteries	A power-loss/EMO induced AKS computer shutdown may result in irreparable CPU damage if the computer's internal UPS cannot supply backup power to allow a sequential shutdown of the system.	04/06/05
40	04/06/04	Failure to detect Missed Dropoff Error for Cassette Style Queues; Potential Wafer Scrap Issue	Not reporting missed dropoff error for cassette style queues. This problem only exists on benches that are configured to process two cassette lots. The failure of the system to recognize a missing cassette at the queue can cause wafer breakage since if the cassette is not on the queue it must be somewhere else within the station.	04/06/05
41	04/14/04	BNC Connector Install and Removal Tool	Megasonic transducer BNC connectors are difficult to install and remove using needle nose pliers. Often, entire tank and frame assemblies must be removed to access the BNC connectors.	04/14/05
42	04/28/04	Upgraded Capacitive Tank Level Sensor for LuCID Dryer	As part of Akrion Systems's continuous improvement program (CIP), Akrion Systems is introducing an upgraded capacitive sensor for the sensing of the liquid level in the LuCID dryer process tank. This upgraded sensor version is equipped with a moisture-compensating feature, which enhances and improves the sensor functionality and reliability. Therefore the use of the "sensor pads" (gasket) is no longer required.	04/28/05
43	06/07/04	Ordering Replacement Computers	Field replacement of partial computer assemblies has resulted in an unacceptable start-up failure rate due to either hardware or configuration failures or incompatibilities.	06/07/05



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44	06/10/04	Intermittent exhaust and phase monitor faults.	Loose hex-lug power bus connections on the main power feed wires (L1, L2 and L3) and input/output lugged connections of both the main circuit breaker CB1 and main contactor K100, have been isolated as sources for voltage anomalies which have led to intermittent component faults and alarms.	06/10/05
45	07/13/04	Product Detect Sensor, Robot	As part of Akrion Systems's continuous improvement program (CIP), Akrion Systems is introducing a new robot product detection sensor that provides better performance and increased reliability.	07/13/05
46	08/19/04	PART CHANGE NOTICE, REPLACEMENT PART/UPGRADE N2 Anti-static Emitters, LuCID dryer	To address customer concerns over possible tungsten contamination of product, Akrion Systems is introducing an upgraded N2 Anti-stat emitter for its LuCID dryers.	08/19/05
47	09/27/04	Proper wet station shutdown and startup practices. Preventing data file corruption and power surge damage to the computer.	Damage to the wet station computer due to improper shut-down and re-start technique. Most common when cycling the station off and on.	09/27/05
48	12/14/04	Inconsistent Tank Lid Operation	Erratic operation of tank lids due to inconsistent facilities water pressure. (City water pressure supply must be between 45 to 55psig)	12/14/05
49	03/16/05	EE Wash Dry matrix display difference; Software Version 5.xx versus 6.xx	Improper programming of the EE Wash Dry Matrix due to changes in matrix layout.	03/16/06
50	07/20/05	AKS V6 Charting and Trending Usage – Computer Hard Drive Maintenance Considerations	Computer lock-ups, thread Data Collection shutdown.	07/20/05
51	07/28/05	LuCID2 Rod Adjuster Inspection for Correct Tolerances	The fixed end of some LuCID2 lid piston rod adjusters may be manufactured to incorrect tolerances.	12/31/05



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52	12/04/05	Lucid2 Hot N2 Line	The hot N2 line on LuCID2 Dryers may de-flare over time due to heat.	12/04/06
53	01/19/06	Megasonic Power Control System, Software Revisions 6.04.001 – 6.04.021	Poor or erratic cleaning performance on wet stations running Software Revisions 6.04.001 – 6.04.021	01/19/07
54	01/19/06	GAMA LuCID2 Slow Drain Rate; Particle and Performance Problems	Particle performance and drain rate inconsistency.	01/19/07
55	02/16/06	GAMA Genius I/O Interface Board Reset	A hardware/software incompatibility may cause the Genius I/O interface board to perform a 5-second reset. Normal operation resumes after the reset. During the reset, problems may occur that can lead to damage to tool and/or product damage.	02/16/07
56	04/26/06	LuCID2 sensor detection issue during slow drain cycle	Due to the location of the sparger plate in 200mm Chem. Inject LuCID2 Dryers, the low level capacitance sensor may falsely detect liquid when the tank is empty. The issue occurs from the residual HF forming on the sparger plate and the tank wall.	04/26/07
57	07/06/06	Correct tool software to run GAMA computer upgraded with Genius I/O PCI cards that replace older ISA card. This TB supersedes TB 55 long term solution plan.	Review the following information issued with each PCI upgraded computer to prepare for a minimal down time installation.	07/06/07
58	11/15/06	Genius I/O PCI Card (PN 228699-001) DIP Switch Settings	Genius I/O PCI cards used in GAMA wet station computers must have the four DIP switches on the card set to the OFF position. Not having these set to OFF changes the bus impedance. This can lead to IO faults or damage to the IO system hardware	None
59	02/05/07	GAMA, I-Clean, V3 Filter Recommendations	Confusion over which filter elements are recommended by Akrion Systems for various process chemistries. Recommendations now controlled document OP2042.	None



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60	03/01/07	North America 2007 Daylight Saving Time Correction: Windows 2000	As mandated by the Energy Policy Act of 2005, beginning in 2007, Daylight Saving Time will start the 2nd Sunday in March and end the 1st Sunday in November.	None
61	03/01/07	Ozone Gas Leaks; Kel-F tubing; PFA Tubing	Ozone flow kits plumbed with Kel-F (PCTFE) tubing may be prone to leaks	None
62	03/06/07	UPS Model PW5125: Nuisance Power Loss; Kit 229480-001	Nuisance power down of tool electronics when Model PW5125 UPS1 or UPS2 switches to battery power.	None
63	04/09/07	LuCID2 heated N2 flex line. Poor LuCID2 performance. This bulletin supersedes TB 052.	The rigidity of the inner N2 tube and the sharp angle the tube must make from the heater box 3-way diverter valve to the connection on the back of the LuCID2 can cause stress cracks in the line. Improperly dried wafers may result.	None
64	06/13/07	GAMA Robot Horizontal Gear Head Replacement; Motor Mounting Plate. Older Systems	After replacement of a GAMA Robot Horizontal Gear Head (RBT1A0012), the new gear head binds against its motor mounting plate. The motor gear head design was changed by the OEM supplier.	None
65	06/28/08	GAMA Wet Stations; Analog Liquid Flow Meters; Unnecessary Adjustment	Problems have resulted from unnecessary adjustment and or display mode changes to Akrion Systems liquid flow meters	None
66	08/20/07	Akrion Systems Automated Wet Stations Software Revision 6.05 - Critical Software Correction	Wet stations having lidded tanks can be at risk for robot/lid collisions when running recipes that use dip moves.	None
67	11/07/07	Electronic flow controllers may fail prematurely; Units covered under warranty will be upgraded prior to failure event	To prevent any premature failures and unscheduled downtime, these flow controllers have been upgraded to a more robust model effective February 2007.	ON HOLD



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67a	02/18/08	Electronic flow controllers may fail prematurely; Units covered under warranty will be upgraded prior to failure event	PRELIMINARY RELEASE OF TB67 WAS PRECAUTIONARY – APPLICATION AND QUALITY INVESTIGATION IN PROCESS TO DETERMINE APPROPRIATE CORRECTIVE ACTION. ETC Q2 2008.	See 67b
67b	07/30/08	Electronic flow controllers may be damaged and may not zero if over-pressurized.	Excessive facility pressure to the flow meters can cause zeroing errors or inaccurate readings. The flow controllers are used in GAMA i-Clean tanks, GAMA G+ tanks, and some V3 process tanks.	None
68	02/22/08	Faith Wafer Transfer Systems; Wafer Engagement Components; Cassette and Carrier Nests; Material Choices	Select process applications can produce wafers that generate wear on Delrin [®] pushers and rollers. This wear can affect their ability to operate correctly.	None
69	03/13/08	LuCID2, LuCID3, UPN2, 3-way valve failures may result in elevated particle trending and potential loss of product	Flow of heated UPN2 can be reduced or stopped if the 3-way valve fails. Investigation of this failure addresses the root cause. It also lists several preventive measures that should not be ignored.	None
70	04/14/08	Akrion Systems Coated Carrier Frame Warranty Extended to 12 Months	Akrion Systems will replace, free of charge, any carrier that exhibits a failed coating for a period of 12 months from date of shipment, (the "Warranty Period"), excluding defects due to normal wear or handling	None
71	05/01/08	GAMA Restart Sequence after a Non-controlled Shutdown; Delete Recovery (.tmp) Files	Unless adequate precautions are taken, restarting the AKS software after a noncontrolled shutdown can result in unpredictable software operation and damage to product, especially if the shutdown occurs while the robot is moving. A noncontrolled shutdown occurs when the computer suddenly loses power, a Windows operating system error occurs, or the AKS software experiences a thread loss or other fatal error.	None



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72	10/13/08	I-Clean Module; UPN2 Pressure Regulator Manifold; Prevent Chemical Vapor Out-Gassing; Corrosion Failures	When the pressure vessel (PV) of an I-Clean module is depressurized all chemical vapor inside the vessel should vent through the exhaust line.	
73	11/17/08	AKS Software; Akzion Systems Name Change Modifications	The new company name has required renaming folders and file names in the AKS wet station software.	
74	01/06/09	Ordering Programmed Robot Motor Controllers and Amplifiers; Standard GAMA, Gantry GAMA, Rearmount Wetstations; Problems with Un-programmed Controllers and Amplifiers	Robot motor controller and amplifier part numbers listed on Akzion assembly drawings are for un-programmed units. Ordering un-programmed controllers and amplifiers has resulted in installation problems and delays.	
75 GF0 42	01/22/09	Akzion Systems In-line Resistive Heater Leak	Akzion Systems In-line resistive heaters and heat exchangers may leak from the flange. Field data has been reported only in Single Wafer applications to date.	
76	07/22/10	SAFETY ALERT - Chemical Heater Reset – DeviceNet GAMA & Semi Auto V3	GAMA DeviceNet and V3 heater circuits require alterations or setup configuration changes to ensure an over temperature (OT) condition/alarm must disable the heater until a manual reset has occurred.	
77	8/23/10	Series 4 PCs; Monitor Image Shift/Flicker; Correct Display Settings	Series 4 PCs shipped to customer sites prior to August 16, 2010 had been imaged with a display setting which may result in a screen shift/reduction and possible “flicker. These symptoms have been reported on early issued UIMs (User Interface Monitor) whose monitors were supplied without any manual screen control switches.	



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78	12/17/10	Gen 3 Robot Software Version 6.06.016 or later – Vertical speed changes required	Changes in the vertical units of measure resulted in 2x vertical speed increases, specific to “Gen 3” robot upgrade installations. Existing Gen 3 robot systems that require a software upgrade to version 6.06.016 or higher will require vertical speed adjustments to prevent excessive vertical robot speeds.	
79	1/17/11	V3 Computer Software Backup; Customer Action Required	Akrion Systems is unable to provide V3 operating software prior to version 6.07.00. Customers running V3 software prior to 6.07.00 must maintain a secure backup of their current software. This backup is required if a replacement computer is purchased. Akrion Systems will install the customer supplied V3 system software backup onto any replacement computer purchased from Akrion.	
80	2/4/11	Fire System CO2 Actuator Inadvertent Discharge	High Pressure CO2 valves may not adequately vent pressure and auto discharge without sounding of an alarm. This would cause all cylinders on a specific system to discharge.	
81	2/28/11	Proper V3 Start-up Procedure; Turning on Minute Man Endeavor UPS	If the proper start-up procedure is not followed, the V3 system UPS (Minute Man Endeavor Series ED1500RM2U) will not turn on.	
82	4/5/11	Proper IN-USA Ozone Cabinet Set-up After Power Up	Powering off the IN-USA Ozone Cabinet causes the generator “Generator ON/OFF” parameter in the SC1-Turbo Controller to default to OFF. When the cabinet is powered back up it will not generate ozone when asked to do so by wet station software.	



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83	4/5/11	Prevent Scheduling Errors; Cold computer reboot; tmp. files; timer “wrap around”	Computer Preventive Maintenance is required to prevent scheduler error symptoms resulting in throughput and production losses. Robot “early by” and “late by” and “Critically Overprocessed” errors, alarms and events are caused by software timer “wraparound”.	
84	6/21/11	150MM Carrier Rod Style Replacement Difference - New Supply Rev. Change	The current design of these specific 150mm lower and upper rods 204759-001 and 204760-001 have a solid center section that will change to a continuous row of slots as shown below. The part numbers will remain the same.	
84a	8/31/12	150MM Carrier Rod Style Replacement Difference - New Supply Rev. Change	The solid center section was removed on the 150mm lower rods (See PNs listed above). The new revision lower rods have been profiled the entire length as a design improvement. Do not be confused by this change in appearance.	
85	7/5/11	Replacement Kit for Obsolete Mini-environment VFD fan controllers	Mini-environment VFD fan controllers -- Seimens MicroMaster Jr (PN 228649-001) and Yaskawa J7 (PN 232446-001) used on GAMA and E200 systems are obsolete and no longer available from their manufacturer.	
86	7/5/11	Software Backup; Media Size Limitation; Versions 6.06.018 and earlier	When using the Akrion Systems backup utility to perform backups onto portable media the maximum size of the media is 2 gigabytes for software versions 6.06.018 and earlier. Any media over 2 gigabytes causes an problem	
87	3/22/12	Single Lot Processing Mode	This bulletin gives instructions on how to obtain and enter Software Authentication Codes.	



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88	3/22/12	GAMA and HVM Solar Robot Service; Supporting Robot Arm Assembly; Safety and Damage Prevention	Without proper support the robot arm assembly can fall causing personal injury and/or damage to the assembly. Follow the procedure in the solution below to prevent injury or damage	
88a	3/29/12	GAMA and HVM Solar Robot Service; Supporting Robot Arm Assembly; Safety and Damage Prevention	Slight change in wording to stress that this procedure is to be followed when servicing the robot.	
89	8/30/12	Recalled and reissued as TB 84a		
90	4/4/13	VCS meg tube cooling water recommendation to enhance performance longevity	City water purity can vary site to site. Some sites have experienced reduced service life of transducer tube assemblies. Evaluations have shown mineral deposits/buildup within certain cooling water partitions of the tube assemblies which resulted in reduced cooling efficiency. An elevated heat level within the tube assembly is a known contributor to reduced service life.	
91	6/11/13	Quick dump door may separate from dump piston – inspect and correct	QDR or EEWD tanks do not fill and/or drain when the dump piston is activated. The Dump piston shaft is missing the set screw blind hole. The set screws may eventually work loose causing the disk (dump door) to remain stuck to the bottom of the tank (does not drain) or become separated from the shaft (will not fill).	
92	8/8/13	Single Wafer Chuck – PM Mach2HP/MP and Velocity	Lack of regular PM effects the reliability of the tool performance and could cause premature failures of 3-post, 4-post and 6-post wafer chucks.	