



## PTW ASIA PTE LTD

<b>ASM International A412 Vertical Atmospheric Furnace</b>	
<b>Manufacturer</b>	ASM
<b>Model</b>	A412
<b>Product Description</b>	Vertical Atmospheric Furnace
<b>Year of Manufacture</b>	2007
<b>Serial Number</b>	30405
<b>Wafer Size</b>	300mm
<b>Process</b>	ATMOXANNL
<b>System, General Specification</b>	
<b>Safety Specification</b>	SEMI S2-0703/CE
<b>Heater Model</b>	Heating element ATM FR
<b>Process Condition</b>	AP
<b>Process Temperature</b>	(C)
<b>ART Control</b>	None
<b>N2 Load Lock</b>	Yes
<b>Wafer Type</b>	300mm-Si SEMI STD-Notch
<b>Qty. of Production Wafers</b>	150wfr
<b>Side Maintenance</b>	None
<b>Software Version (WAVES)</b>	Latest
<b>Boat Operation</b>	2 Boat Type
<b>Temperature Controller</b>	MTC
<b>System, Unit Location</b>	
<b>Furnace</b>	Main-Fab
<b>Power Box</b>	Sub-Fab
<b>Pump</b>	N/A
<b>FTR</b>	Sub-Fab
<b>Step Up Transformer</b>	N/A
<b>Step Down Transformer</b>	N/A
<b>Ozone Delivery System</b>	N/A
<b>WVG Controller</b>	N/A
<b>Liquid Delivery System</b>	N/A

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UPS	None
<b>System, Factory Automation</b>	
Host Communications	Comply with GJG
Equipment Host I/F Connection	Power Box Top HSMS (10Base-T)
Group Controller Connection	None
OHT Capability	Yes
AGV Capability	None
RGV Capability	None
PGV Capability	None
PIO I/F Location	FNC Top
PIO Provided by	Customer
PIO Maker/Model	N/A
Carrier ID Reader Writer Type	RF
CIDRW Load Port	Read
CIDRW FIMS	Write
CIDRW Maker/Model	Asyst/ATR9100
CIDRW Provided by	ASM
FDC FDC(Fault Detection and Classification)	N/A
<b>System, User Interface</b>	
Signal Tower Model	LOUGWB-24-4
Signal Tower Colors	Signal Tower Colors (from the Top), Red/Yellow/Green/Blue
Signal Tower Location	Front Operation Panel
Front Operation Panel	Yes
MMI and Gas FlowChart	Gas Box & Front Operation Panel Installed
Indicator Type	Superset
Operator SW	Standard
Pressure Display Unit	MPa / Pa
Cabinet Exh Pressure Display	Cabinet Exhaust Pressure Display Unit=Pa
Warning Label	English
<b>System, Furnace</b>	
Dewpoint Meter for N2 Load Lock	Yes
RCU Duct Length FNC - RCU	NA
Ionizer (maker/model)	None
Chemical PreFilter-Acid Chemical Pre-filter (for Acid)	None
Chemical PreFilter-Alkali Chemical Pre-filter (for Alkali)	None
Chemical PreFilter-Hydrocarb Chemical Pre-filter (for Hydrocarbon)	None

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Chemical PreFilter-Location Chemical Pre-filter Location	N/A
Side FFU Chemical Filter Side FFU Chemical Filter	None
O2 Control for N2 LL O2 Density control for N2 Load Lock	Yes
<b>System, Wafer/Carrier Handling</b>	
Carrier Type	FOUP/25slots, SEMI STD
FOUP Maker/Model	FOUP Maker/Model= Entegris/F300-2005-17UT1502
Carrier Stage Capacity	32 FOUP
Info Pad A,B	None
Fork Material	END EFFECTOR242*2 CERAMIC
W/T Type	Gemark WHR
W/T Type A/T	Standard
<b>System, Power Distribution</b>	
Voltage 3phase	480VAC
3phase connection type	Star Connection
Voltage Single-phase	120VAC
Single-phase connection type	N/A
Wattmeter	None
Control Power UPS provided by	Customer
Control Power UPS type	N/A
UPS Input/Output Voltage	N/A
<b>System, Gas Distribution</b>	
IGS Type	Integrated Gas System
IGS Maker	Fujikin
Tubing Bends	Bend Less than 90deg
IGS Final Filter	PALL
IGS Regulator	Tescom
IGS MFC	HORIBA STEC-Z500series/ Digital
IGS Press. Transducer	Celerity
Liquid Source Vapor System Liquid Source Vapor System Maker/Type	None
Auto-Refill System	N/A
Auto-Refill System Provider	N/A
Refill System Tubing	N/A
Vacuum Gage - Press Ctrl	N/A
Vacuum Gage - Press Monitor	N/A
Vacuum Gage - Pump Monitor	N/A
Main Valve	N/A

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<b>Pump Maker/Model</b>	N/A
<b>Pump Provided by</b>	N/A
<b>N2 Dilution Unit Provided by</b>	N/A
<b>Pump Power</b>	N/A
<b>Pump Control Unit Location</b>	N/A
<b>Vacuum Piping Provider</b>	N/A
<b>Gas Leak Detector</b>	None
<b>Gas Leak Detector Provided By</b>	Customer
<b>Gas Leak Detector Maker</b>	Customer - House System
<b>Gas Detector Power</b>	Customers Facility Provided
<b>Detected Gas 1 / Location</b>	H2/Gas cabinet
<b>Detected Gas 2 / Location</b>	NH3/Gas cabinet
<b>Detected Gas 3 / Location</b>	H2/BUBBLER Cabinet
<b>Detected Gas 4 / Location</b>	HCL/BUBBLER Cabinet
<b>Detected Gas 5 / Location</b>	NH3/BUBBLER Cabinet
<b>Detected Gas 6 / Location</b>	HCL/Reactor Cabinet
<b>Detected Gas 7 / Location</b>	NH3/Fast ramp
<b>External Torch Unit</b>	Installed
<b>Burn Out Unit</b>	N/A
<b>PAC</b>	None
<b>Exhaust Pressure Control</b>	N/A
<b>Exhaust Pressure Controller</b>	N/A
<b>Vacuum Exhaust System</b>	N/A
<b>Vacuum Pressure Controller</b>	N/A
<b>Heater Tape Interface</b>	Heater Tape Interface
<b>System, Reactor</b>	
<b>Quartz Provided by</b>	ASM
<b>Quartz Vendor Requirement</b>	None
<b>SiC Provided by</b>	N/A
<b>SiC Vendor Requirement</b>	N/A
<b>Liner Tube (AP)</b>	N/A
<b>Process Tube (AP, AP+Sub-AP)</b>	Quartz Single
<b>Outer/Inner Tube Material</b>	N/A
<b>Inner Tube Type (LP)</b>	N/A
<b>Inner T/C</b>	Process Tube interior wall type (for AP Heater)
<b>Tube Sealing</b>	N2 purge+Lip seal
<b>Manifold Heater</b>	N/A
<b>Valve,Manifold PCW</b>	N/A
<b>Soft Backfill Injector</b>	N/A
<b>Boat Type</b>	170 slots Ladder (5.3mm Pitch)

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<b>Boat Material</b>	Quartz
<b>Boat Rotation</b>	Yes
<b>Pedestal Type</b>	Quartz
<b>Cap Heater</b>	None
<b>Auto Shutter</b>	No Storage Purge Type
<b>Earthquake Countermeasure</b>	None
<b>Process Cap</b>	Process Cap
<b>System, Facilities</b>	
<b>Exhaust Connection Point</b>	Top Connection
<b>PCW Connection Point</b>	Bottom Connection
<b>Incoming Gas Connection Point</b>	Bottom Connection
<b>Gas VENT Connection Point</b>	Bottom Connection
<b>Exhaust VENT Connection Point</b>	Bottom Connection
<b>Gas Unit Exh Connection Point</b>	Bottom Connection
<b>Power Cable Input Location</b>	Power Box Top
<b>Gas Exhaust Connection Point</b>	Top Connection
<b>Damage/Missing parts list</b>	
<b>Missing- RETRO O2 ANLZ PBI OXI-4 CAR P/N: 2477033-01 Qty 1</b>	
<b>Missing- O2 ANALYZER PBI OXI-3 120VAC PN: 830065814 Qty 1</b>	
<b>Missing- INST MSC3- PC-A412 PN: 2322722-01 Qty 1</b>	
<b>Missing- WHR ROBOT PN: 2304678-01 Qty 1</b>	
<b>Please inspect tool to reconfirm</b>	



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**Micron FAB11 ADENBC 0300(AANF204 30405)**



**Tool Status**

R1 SCS

R2 SCS

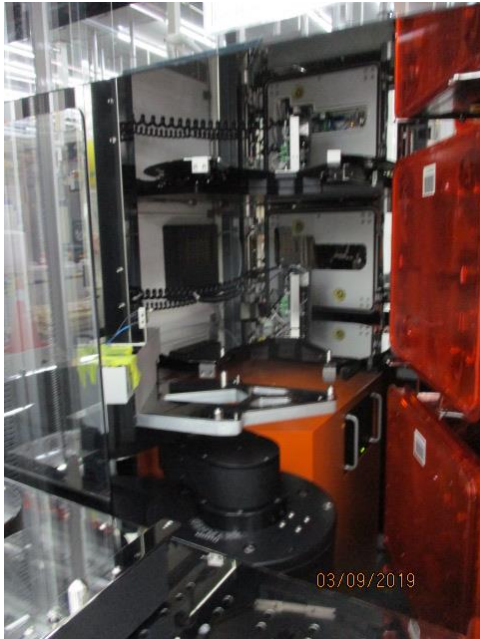


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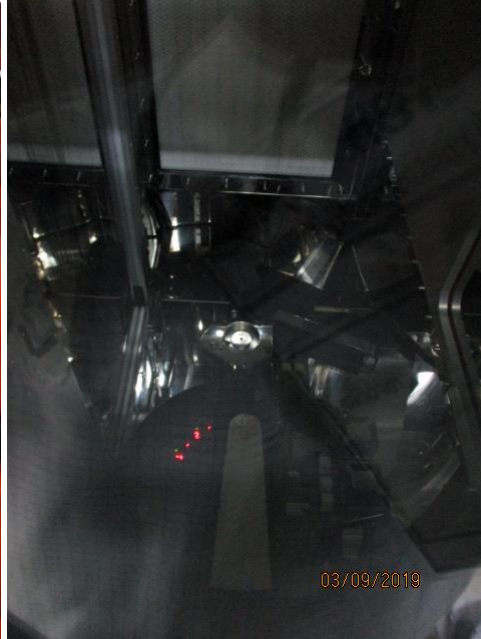


## Robot Status

CHR



WHR



## Power Supply Brake

R1



R2



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## TCP/ECP

R1



R2



## Supply Gas Status

R1



R2



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### Gas Flow Panel Status



### Heater Status



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### Torch Status



### TCF Status



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## Fast ramp blower status



## Software Versions

Software versions							
Software reference		6 800					
Tool controllers							
	Model	Version	Date				
MSC	A412	2.13	28-May-18				
WHC	A412	8.02	11-Oct-11				
CHC	A412	5.10	12-Oct-11				
ETC	A412	2.10	03-Feb-11				
Tube controllers							
T1 AANF204A				T2 AANF304B			
	Model	Version	Date		Model	Version	Date
DPC	A412	2.W2	28-Sep-11	DPC	A412	2.W2	28-Sep-11
DTC				DTC			
MTC	A412AH	2.23	04-Feb-11	MTC	A412AH	2.23	04-Feb-11
Robot controllers							
	Serial#	Version	MCL Version	DEE Version			
WHR	307074	GB4S-4.29A	2.93				
CHR	30731	GB4-4.03FC	2.26				

## Digital I/O R1

Recipe status											
Recipe 3-0000H					Step# 3						
Digital Inputs					Digital Outputs						
Nr	Name	Status	Nr	Name	Status	Nr	Name	Status	Nr	Name	Status
1	NO-Prs	OK	17	TorchTemp	TOO LOW	1	NO-Cof	CLOSED	17	BubBypass	CLOSED
2	PCA-Prs	OK	18	PatcoOTS	OK	2	NO-D	OPEN	18	BubTuba	CLOSED
3	ExtGasC	OK	19	FlameOTS	NO-FLAME	3	CO-Hi	CLOSED	19	SubWO	CLOSED
4	OCERatio	OK	20	MareMod	AUTOMATIC	4	CO-La	CLOSED	20	OCERW	OFF
5	IntSpr	NOTREADY	21	ChrRem	AUTOMATIC	5	NRG-Src	CLOSED	21	DCERBackF	OFF
6	PRBlower	ON	22	PRHCTemp	OK	6	NO-Bub	CLOSED	22	OTSProc	OFF
7	Pre-Int	OK	23	Low-Int	OK	7	Ar	CLOSED	23	OTSStg	ON
8	GasCons	OK	24	Ext-Prs	OK	8	RS-Src	CLOSED	24	NO-Pig	CLOSED
9	FlngTemp	OK	25	Ext-Bubd	OK	9	NRG-Mn	CLOSED	25	NRG-Pig	CLOSED
10	Ext-PrsC	OK	26	PRAnTemp	OK	10	NO-E	OPEN	26		
11	TubeClear	OK	27	BubTemp	OUTRANGE	11			27		
12	Overheat	OK	28	RetLvl	OK	12	CO-Ar42	N2-PURGE	28		
13	HDC-Prs	OK	29	TubePrg	NOTACTV	13	NO-Mn	CLOSED	29		
14	GenReady	NOTREADY	30	ScrF-Int	OK	14			30		
15	NRGPrs	READY	31	GasAlarm	OK	15	FRUpStr	CLOSED	31		
16	Status	OK	32	GasWarn	OK	16	FRCKStr	CLOSED	32		

■ Alarm programmed in recipe and currently alarming    
 ■ Alarm programmed in recipe and currently not alarming    
 Test Mode (OFF)

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## Digital I/O R2

Recipe status						StepNm 3					
Recipe: STD6300B											
Digital Inputs						Digital Outputs					
Nr	Name	Status	Nr	Name	Status	Nr	Name	Status	Nr	Name	Status
1	IQ-Prs	OK	17	TorchTmp	TOO LOW	1	IQ-Of	CLOSED	17	BubBypass	CLOSED
2	COA-Prs	OK	18	RatioOTS	OK	2	IQ-D	OPEN	18	BubTube	CLOSED
3	EHGasC	OK	19	FlameOTS	NO FLAME	3	IQ-Hi	CLOSED	19	BubVO	CLOSED
4	DCERatio	OK	20	MaintMod	AUTOMATIC	4	IQ-Lo	CLOSED	20	DCERefit	ON
5	NH3Pre	NOTREADY	21	CtrlPerm	AUTOMATIC	5	NH3-Src	CLOSED	21	DCEBackF	OFF
6	FRBlower	ON	22	FRHOTmp	OK	6	IQ-Bubb	CLOSED	22	OTSPric	OFF
7	PreInk	OK	23	LowChPrs	OK	7	Ar	CLOSED	23	OTStby	ON
8	CalCovers	OK	24	ExhIproc	OK	8	IQ-Src	CLOSED	24	H2-Prg	CLOSED
9	FingTmp	OK	25	ExhBubbl	OK	9	NH3-Mn	CLOSED	25	NH3-Prg	CLOSED
10	ExhReacC	OK	26	FRAr7Tmp	OK	10	IQ-E	OPEN	26		
11	TubeDoor	OK	27	BubTmp	OUTRANGE	11			27		
12	Overheat	OK	28	PatLvl	OK	12	O2-Anlz	N2-PURGE	28		
13	IQD-Reac	OK	29	TubePrg	NOTACTV	13	H2-Mn	CLOSED	29		
14	VerReady	NOTREADY	30	ScrtFad	OK	14			30		
15	NH3Flt	READY	31	GasAlarm	OK	15	FRUpStr	CLOSED	31		
16	PreInk	OK	32	GasWarn	OK	16	FRDnStr	CLOSED	32		

## Analog I/O R1

Process Status (User: admin04) [Automatic log out after 14:47 idle] [Test: AS4] [Tube2: AANI-2018]											
Recipe						Elevator					
Recipe	IQ STD6300B	Step	3Time	00:14:50	Position	1300	mm				
StepName	Tube Standby	Waitfor	Start	00:00:10	Setpoint	1300	mm				
					Speed	0	mm/min				
Temperature											
Zone	Setpoint	Delta	Actual	Deviation	Max setpoint	Setpoint	Min setpoint	Actual	To	Rate	Power
Zone 1	300.0	299.9	0.1	379.7	299.7	196.7	299.2	299.2	300.0	0.00	11
Zone 2	300.0	295.55	44.45	369.9	277.6	228.9	279.7	300.0	0.00	0	0
Zone 3	300.0	300.11	-0.11	349.3	295.0	229.3	296.7	300.0	0.00	0	0
Zone 4	300.0	300.0	0.0	340.5	293.3	237.5	294.0	300.0	0.00	0	0
Zone 5	300.0	300.0	0.0	348.0	294.7	240.0	294.8	300.0	0.00	0	0
Top Zone											
Analog I/O											
IO	Name	Setpoint	Actual	H.L.L.	Unit	IO	Name	Setpoint	Actual	H.L.L.	Unit
1	BubTemp	20.0	5.0	0.0	°C	1	HeatTmp	0	37	0	°C
2	IQ-D	10.00	10.00	1.00	0.00	2	TelTmp	0	27	0	°C
3	CO-High	0.0	0.0	3.00	0.00	3	CO-Anlz	0.00	0.00	0.00	PPM
4	IQ-Lo	0.000	0.000	0.200	0.00	4	BubLevel	0.0	4.7	0.0	%
5	IQ-Hi	0.000	0.000	0.600	0.00	5					
6	IQ-Bubb	0.000	0.000	0.100	0.00	6					
7	Ar	0.0	0.0	1.00	0.00	7	NH3-Prs	0	201	0	0.00
8	IQ	0.00	0.00	1.50	0.00	8	Ar-Prs	0.0	1.8	0.00	0.00

## Analog I/O R2

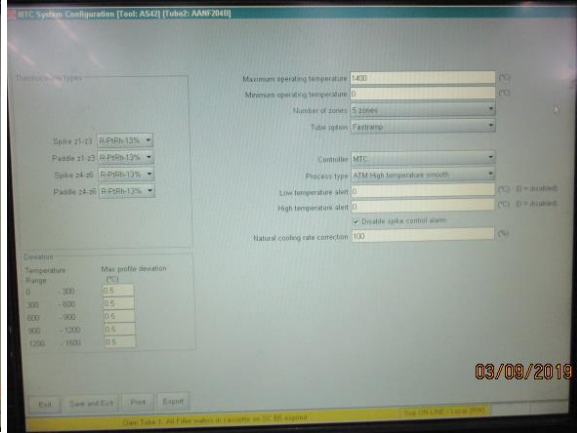
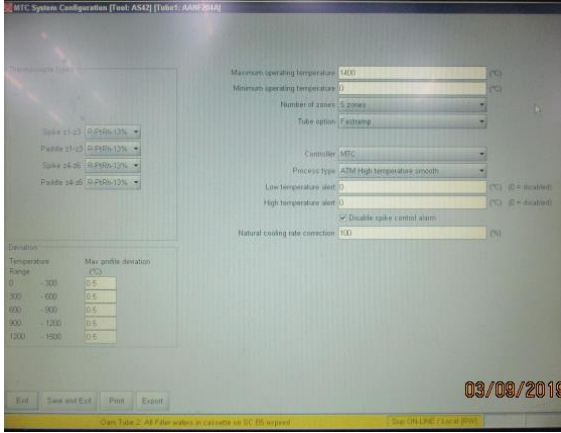
Process Status (User: admin04) [Automatic log out after 14:47 idle] [Test: AS4] [Tube2: AANI-2018]											
Recipe						Elevator					
Recipe	IQ STD6300B	Step	3Time	00:14:50	Position	1300	mm				
StepName	Tube Standby	Waitfor	Start	00:00:10	Setpoint	1300	mm				
					Speed	0	mm/min				
Temperature											
Zone	Setpoint	Delta	Actual	Deviation	Max setpoint	Setpoint	Min setpoint	Actual	To	Rate	Power
Zone 1	300.0	299.9	0.1	379.7	299.7	196.7	299.2	299.2	300.0	0.00	11
Zone 2	300.0	295.55	44.45	369.9	277.6	228.9	279.7	300.0	0.00	0	0
Zone 3	300.0	300.11	-0.11	349.3	295.0	229.3	296.7	300.0	0.00	0	0
Zone 4	300.0	300.0	0.0	340.5	293.3	237.5	294.0	300.0	0.00	0	0
Zone 5	300.0	300.0	0.0	348.0	294.7	240.0	294.8	300.0	0.00	0	0
Top Zone											
Analog I/O											
IO	Name	Setpoint	Actual	H.L.L.	Unit	IO	Name	Setpoint	Actual	H.L.L.	Unit
9	NH3-MFM	0.00	0.00	1.00	0.00	9	IQ-Prs	0.0	212	0.00	0.00
10	IQ-E	0.00	0.00	1.00	0.00	10	CO-Prs	0.0	1.8	0.00	0.00
11	NH3-C5	5.00	4.99	4.00	0.00	11	IQ-Prs	0.0	0.0	0.00	0.00
12	CO-Centr	0	0	0	0.00	12	FRUpTmp	195.0	199.0	0.00	0.00
13	FRBlower	0	0	0	0.00	13	NH3-Prs	0.0	0.0	0.00	0.00
14	FlowAnlz	495	495	900	0.00	14	LowChPrs	0.000	1.445	0.000	0.00
15	IQ-MFM	0.00	0.00	2.00	0.00	15	FRUpLvl	105.0	119.0	0.00	0.00
16	IQ-MF3	0.0	0.0	4.5	0.00	16	BubPress	0	940	0.00	0.00

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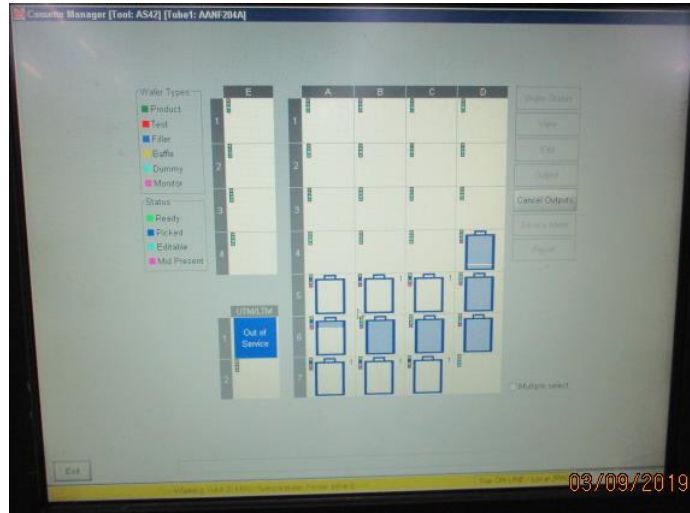
# Temperature control system MTC

R1

R2



## Stoker status



## Motion part control status

Control 1-15				Control 17-30			
Id	Name	Status	detail	Id	Name	Status	detail
1	Leadport shields Left/Right	Undefined	detail	17	WHR	Out of line	detail
2	Leadport doors Left/Right	Out of line	detail	18	Boat Pickup BTM	OK	detail
3	Cassette I/O transfer	OK	detail	19	Gate Valve	Warning	detail
4	Upper/Lower Cassette Transfer	OK	detail	20	Reactor Carousel	OK	detail
5	Upper/Lower Cassette Clamp	Warning	detail	21	Tube Elevator R1/R2	Out of line	detail
6	Stocker Carousel	OK	detail	22	Boat Rotation R1/R2	Undefined	detail
7	UTM/LTM	Warning	detail	23	Boat pickup R1	OK	detail
8	CHR elevator	Warning	detail	24	Boat pickup R2	OK	detail
9	Cassette Calibration	Out of line	detail	25	Tube Shutter R1/R2	Out of line	detail
10	Pick/Put Cassette	OK	detail				
11	Upper/Lower purge door	Out of line	detail				
12	Upper/Lower WHR door	Warning	detail				
13	BTM arm	Out of line	detail				
14	BTM elevator	Out of line	detail				
15	WHR elevator	Out of line	detail				
16	Boat Calibration/Leveling	OK	detail				

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**Boat setting status**  
**R1 Boat wafer slot setting**

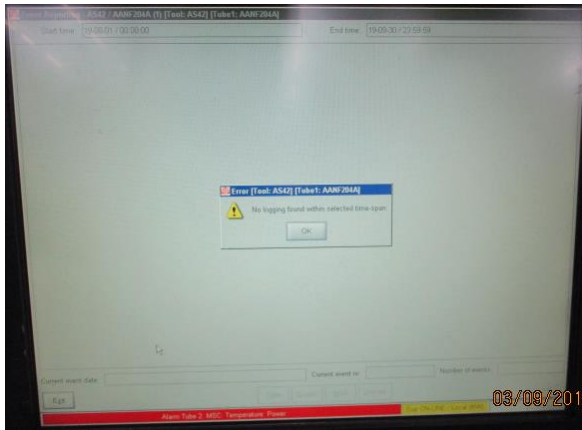
Type	Wafer size (mm)	Slots	Pitch (1/10000")	Delta pitch (1/10000")	Offset (1/10000")	Lift/Drop	Distance (1/10000")	Calibration	Depth	Warning space	Max space	Warning slit	Max slit	Phys. space
Boat A	300mm170	300	170	2117	0	1000	140	100	80	100	225	250	80	100
Boat B	300mm170	300	170	2117	0	1000	140	100	80	100	225	250	80	100
Boat C	None													

**R2 Boat wafer slot setting**

Type	Wafer size (mm)	Slots	Pitch (1/10000")	Delta pitch (1/10000")	Offset (1/10000")	Lift/Drop	Distance (1/10000")	Calibration	Depth	Warning space	Max space	Warning slit	Max slit	Phys. space
Boat A	300mm170	300	170	2117	0	1000	140	100	80	100	225	250	80	100
Boat B	300mm170	300	170	2117	0	1000	140	100	80	100	225	250	80	100
Boat C	None													

**Alarm log**

**R1 alarm log by 1 month**



**R2 alarm log by 1 month**



**PTW ASIA PTE LTD**



All Equipment is offered subject to prior sale. This item will be quoted based upon specific terms and configuration required. Interested parties may contact PTW Asia Pte Ltd at:

[ask@ptwsingapore.com](mailto:ask@ptwsingapore.com)

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