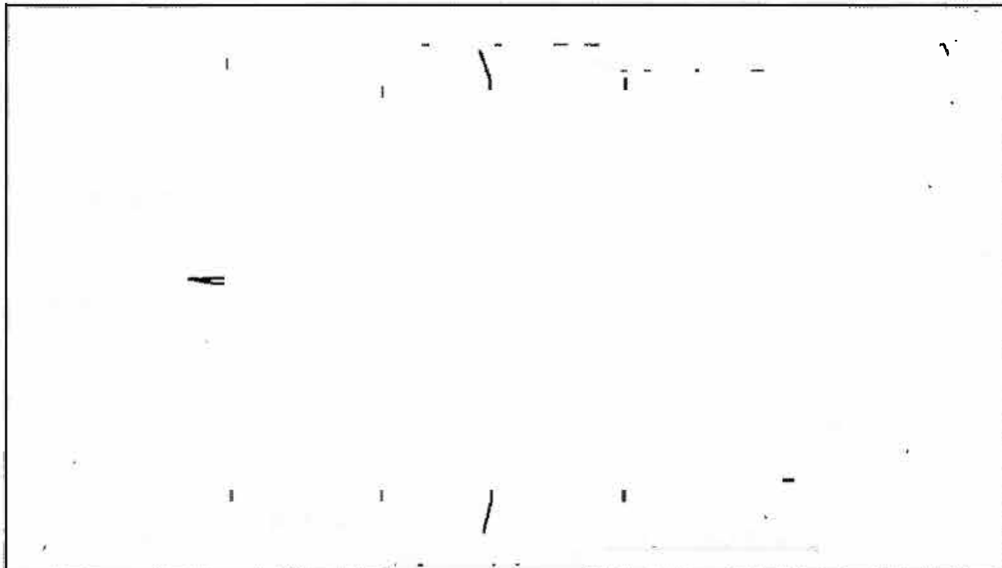
MOOV

III. EQUIPMENT SPECIFICATIONS

3-1. System configuration

3-1-1. Hardware general items

Item	Specifications	Remarks
1. Model Name	F-REX300	
2. Wafer configuration		
1) Substrate	Silicon	
2) Diameter	300 +/- 0.2 mm	
3) Thickness	755 +/- 25 microns	
4) Orientation	Notch	
5) Notch dimensions	Depth 1.00-1.25mm Angle: 89 – 95 °	
3. Wafer processing unit	Single wafer	
4. Outer dimensions (Main system)	W 2700 x D 4100 x H 2500 (mm)	
(Power supply)	W 2600 x D 600 x H 1900 (mm)	
5. Maintenance dimensions(Main system)	W 4500 x D 5000 x H 3000 (mm)	
(Power supply)	W 2600 x D 1400 x H 2100 (mm)	
6. Weight (Main system)	10,080 (kg)	
(Power supply)	940 (kg)	
7. Number of units	15	
Load/Unload port	X1	
Wafer station	X1	
Wafer transfer robot	X3	
Polisher unit	X2	
1st stage cleaner unit (Both side cleaner)	X2	
2nd stage cleaner unit (Both side cleaner)	X2	
Linear transporter	X2	
Filter unit	X2	



3-2. Platform

1. Main frame

	Item	Specification	Remarks
1.	1) Configuration	2 base frame for Polish and Clean unit	
	2) Material	Frame : Stainless steel	
		Base/panel : Steel painted	
		Duct/cleaner casting: PVC	
		Drain pan : PVC	
	3) Painting	White, Blue and Gray,	
	4) Panel removal	Latch type + Bolts	
	5) Doors	Removable hinged type	

2. Airflow design (Transfer/Cleaner unit)

Item	Specification	Remarks
1) Air circulation	Filtering fan unit (ULPA filter 0.16 μm equipped)	
2) Local ventilation	All clean units, cleaner area	
3) Clean air inlet	Filter units installed roof of system	

3. Airflow design (Polisher unit)

Item	Specification	Remarks
1). Local Ventilation	Around Turn table	
2). Clean air unit	Airflow from transfer/clean unit	

4. Piping

Item	Specification	Remarks
1) Material	D.I.W. : PFA (Nippon Pillar super fitting) Slurry : PFA and PTFE (Nippon Pillar super fitting) Drain : PVC	

3-3. Load/Unload port

Item	Specification	Remarks
1. Method	FOUP	
2. Front load	Manufacturer: ASYST Model : 300FL series 3 standard	
3. FOUP Model	Specified by the customer Manufacturer: ~ Model : Part No. : Drawing No. :	3.Carrier ID use barcode (keyence)
4. Wafer quantity in FOUP	25	
5. Number of stage	4	
6. FOUP setting position	Wafer Horizontal, Face UP	
7. Wafer carrying method	Cassette slot integrity	
8. Dummy wafer slot	4 wafers are available	

3-4. Transfer robot

Item	Specification	Remarks
1. Number of Robot	3	
2. Finger	2 types(Wet/Dry) x 3	
1) For FOUP access	Holding method : Dropping Material : PFA coated alumina ceramics	
2) For other unit access	Holding method : Dropping Material: PFA coated Aluminum alloy	
3. Wafer station	4 (Wet x2, Dry x2)	
1) Wafer wetting spray	Equipped	
2) D.I.Water flow rate	Front side : 1.0 liter/min for one wafer Backside : 1.0 liter/min for one wafer Interval spray capability for dead water prevention	

3-5. Polisher Unit

Item	Specification	Remarks
1. Configuration	Top ring (Carrier) x2	
	Turn table (Platen) x2	
	Dresser (Pad conditioning) x2	
2. Top ring (Wafer carrier)		
1) Oscillation	Not capable (on Turn table),	
	Capable(on Buff table)	
2) Polish Surface	Face down	
3) Type	I – head	
4) Number of heads	2	
5) Structure	Split type	
6) Material	Stainless steel/ceramics	
7) Rotating Speed	10 – 150 min^{-1} *1	
8) Driver	Servo motor	
9) Polish Pressure		
(Turn table)	100 – 700hPa *1	
Arm Load	Max down force : 4850N	
10) Backside pressure	50 – 700hPa *1	
11) Wafer holding	Vacuum suction for holding, DI Water and	
	Nitrogen gas for release.	
12) Self cleaning	Interval DI water supply capability	
	for dead water prevention.	
3. Turn Table (Platen)		
1) Table diameter	740 mm	
2) Material	SUS316L	
3) Rotation speed	10 – 150 min^{-1} *1	
4) Driver	Servo motor (Direct drive)	
5) Polish Pad setting	Direct adhesion	
6) Number of slurry lines	4 lines x 2 tables	
7) Slurry nozzle	Auto turn nozzle	
8) Table cooling	Water jacket is provided	
9) Atomizer	Cartridge type (removable)	

Item	Standard spec	Remarks
4. Dress (Pad Conditioning)		
1) Method	Diamond plate (36 nodes dressing plate with nickel plated diamond).	
2) Disc diameter	360mm	
3) Rotating Speed	10 – 150 min^{-1} *1	
4) Oscillation	Not Capable	
5) Driver	Servo motor	
6) Pad Load	100 – 400 N	
7) D.I. water supply	1.0 - 1.5 liter/min	
8) Self cleaning	Dresser tray :0.8 liter/min Dresser :0.5 liter/min (spray nozzle) Interval DI water supply capability for dead water prevention. It also works for Pad wetting.	

*1

3-6. Buff table

Item	Specification	Remarks
1. Number of Table	2	
2. Table size	W 405 x D 450 (mm)	
3. Material	Titanium	
4. Rotation of motor	100 – 750 min-1	
5. Motion	Scroll (Motion diameter 20mm)	
6. Driver	Servo Motor	
7. Pad preparation method	Direct adhesion	
8. Number of slurry lines	2 Port x2	
9. Number of DIW lines	1 port x2	
10. Pad dresser	Brush type (Hard: Dia.0.41mm)	
11. Pad Load	60 – 100N	
12. Top-ring pressure	100 – 160hPa	
13. Atomizer	Cartridge type (removable)	

3-7. Slurry Supply Line

Item	Specification	Remarks
1. Supply	Flow control valve + injector (Diaphragm pump)	
2. Number of Supply line	4 lines×2 Turn tables 2 lines×2 Buff tables	
3. Capacity	100 – 500 ml/min (reference value)	

3-8. Linear transporter

Item	Specification	Remarks
1. System Configuration	Wafer Turn over x2 Lifter x2 Linear stage x4 Pusher x2	
2. Turn Over unit		
1) Wafer Handling	Arm (open/close) and Roller chucking	
2) Wafer Handling Material	PCTFE	
3) Wafer Wet	D.I. water spray Front side : 1.0 liter/min for each unit Backside : 1.0 liter/min for each unit Interval DI water spray capability for dead water prevention	
3. Lifter	D.I. water spray Front side : 2.0 liter/min for each unit Backside : 2.0 liter/min for each unit Interval DI water spray capability for dead water prevention	
4. wafer stage		
1) Material to touch wafer	PCTFE	
2) Number of Wafer station	4	
5. Pusher		
1) Top ring clean	D.I. water spray (2.0 liter/min for each unit)	
2) Wafer contact parts	D.I. water spray (1.0 liter/min for each unit) Interval DI water spray capability for dead water prevention.	

3-9. Cleaner Unit

3-9-1. 1st stage cleaner (Roll / Roll)

	Item	Specification	Remarks
1.	Configuration	Both side wafer cleaning Roll sponge scrub Chemical / D.I.Water spout rinse	
2.	Front side Cleaning		
	1) Fixed arm nozzle type Megasonic jet		
	a> Configuration	Fixed type	
	b> DIW flow rate	3.7 – 3.8 liter/min^{-1}	
	c> Power		
	(Frequency)	400 kHz	
	(High frequency power)	Max 60W	
	2) Roll sponge diameter	38 mm - 40 mm (in wet)	
	3) Sponge Material	PVA	
	4) Rotating	50 - 200 min^{-1}	
	5) Sponge Position adjustment	0.1 mm pitch control (with pressure monitor)	
	6) D.I.Water flow rate to wafer	0.5 – 0.6 liter/min (Digital operation)	
	7) D.I.Water flow rate to roll sponge	0.4 – 0.5 liter/min Interval water supply for dead water prevention	
	8) Chemical spout rinsing		
	a> Number of chemical lines	1 line	
	b> Flow rate	Minimum 0.6 liter/min	
	c> Usable temperature	Below 45 ℃	
	d> Flow meter	Equipped on each line	
	e> Usable PH range	2–12	
3.	Backside Cleaning		
	1) Roll sponge diameter	38 mm - 40 mm (in wet)	
	2) Sponge Material	PVA	
	3) Rotating speed	50 - 200 min^{-1}	
	4) Sponge Position adjustment	0.1 mm pitch control (with pressure monitor)	
	5) D.I.Water flow rate to wafer	0.8 - 1.0 liter/min	
	6) D.I.Water flow rate to roll sponge	0.4 – 0.5 liter/min Interval water supply for dead wafer prevention	

7) Chemical spout rinsing		
a> Number of chemical lines	1line	
b> Flow rate	Minimum 1.2 liter/min	
c> Usable temperature	Below 45 ℃	
d> Flow meter	Equipped on each line	
e> Usable PH range	2 –12	
8) Wafer chucking		
a> Roller Material	Urethane rubber	
b> Rotating Speed	50 - 150 min^{-1}	
9) Ventilation control	Manual damper	
Monitoring	Exhaust pressure indicator	

3-9-2. 2nd stage cleaner (Pencil)

Item	Specification	Remarks
1. Configuration	Both side wafer clean	
	Front side pencil scrub + Spin dry	
	Chemical / D.I.Water spout rinse	
2. <u>Front side Cleaning</u>		
1) Megasonic Jet		
a> Configuration	Oscillation arm nozzle type	
b> D.I.Water flow rate	1.2 - 1.3 liter/min	
c> Power		
(Frequency)	1MHz	
(High frequency power)	Maximum 60W	
d> Dissolve Nitrogen Water	DN_2 water can be used only 1 line of megasonic	
2) Pencil sponge diameter	ϕ28 mm (in Wet)	
3) Pencil sponge height	34.5 +/- 0.5mm (with holder in wet)	
4) Sponge material	PVA	
5) Rotating speed	50 - 180 min^{-1}	
6) Sponge Position adjustment	0.1mm pitch control (with pressure monitor)	
7) D.I. Water flow rate to wafer	0.5 – 0.6 liter/min	
8) Chemical spout rinsing		
a> Number of chemical lines	1 line	
b> Flow rate	Minimum 0.6 liter/min	
c> Usable temperature	Below 45℃	
d> Flow meter	Equipped on each line	
e> Usable PH range	2– 12	
3. <u>Backside Cleaning</u>		
1) D.I. Water flow rate	1.0 - 1.1 liter/min	
	Interval water supply for dead water prevention	
2) Chemical spout rinsing		
a> Number of chemical lines	1 line	
b> Flow rate	Minimum 1.2 liter/min	
c> Usable temperature	Below 45degC	
d> Flow meter	Equipped on each line	
e> Usable PH range	2– 12	
3) Wafer Chucking	Holding at wafer edge	
a> Chucking Material	PCTFE	
b> Rotating Speed	100 - 2500min^{-1}	
4) Ventilation control	Manual damper	
a> Monitoring	Exhaust pressure indicator	

3-10. Power Supply

Item	Specification	Remarks
1 . Circuit Breaker Back up power supply	Independently installed on each module VME bus, Board computer, and touch panel computer (for 30sec)	
2 . Operation controller 1) Hardware	VME bus, Board computer Main CPU : 68 series 32 bits	
2) O/S software	OS-9/C language description Individual control by each module	
3) I/O connections with module	Serial communication Wiring saving system	

3-11. Control Recipe

Item	Specification	Remarks
1. Total recipe	Consist of three unit recipes Polish recipe 1st clean recipe 2nd clean recipe	

2. Number of recipe

	Polish	1st stage clean	2nd stage clean
No. Recipes(Max 500)	500	50	50
No. Steps in Recipe	16	8	8
No. Parameter	57	17	14

Item	Specification	Remarks
3. Back up	Floppy disk and Zip drive	
4. Recipe setting	Capable to set by each wafer	
5. Process interlocks	1) Top ring rotation speed 2) Turn table rotation speed 3) Pad conditioning disc rotation speed 4) Backside Pressure 5) Polish pressure 6) Dresser load 7) D.I.W Pressure 8) N_2 gas Pressure 9) Slurry Supply Pressure	