

Kuttler Automation Systems (Suzhou) Co., Ltd.



KÜTTLER
AUTOMATION SYSTEMS

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Quotation No: MFX080512-ES1065B
Machine No.: G0802
ERP Item: PWP08017
Date: 2008-07-12

1. Machine Specifications

Machine description	ES Machine for F-PCB
Machine speed	
Conveyor Speed	0.4 -2.5 m/min
Operating Speed	1.0 m/min
Machine configuration	
Working width	650mm
Conveyor width	730mm
Conveyor Height	950 mm (+/- 25mm)
Module materials	Polypropylene
Conveyor type	
	Double sided drive
Axle pitch	25 mm
Main drive shaft	14mm, Hexagon
Conveyor drive axle	Φ 10mm
Axle/Shaft material(s)	required according process: Stainless steel, Ti
Main drive gear:	Φ 55mm, bevel
Axle gear:	Φ 40mm, bevel
Gear material:	PVDF
Bearing carrier:	20mm; Thick, PVDF
Conveyor rollers	Φ 32mm, Φ 10mm inner diameter, 6mm thick, Santoprene
Roller array:	Staggered array
Working Direction	
	Right → Left
Panel specification	
Panel thickness	0.001 inch~0.06inch(core thickness) Adhesiveless material with 5micro copper both sides on 1mil Kapton. 12micro copper single side on 12micron Kapton.
Panel size	6 inch x 6 inch(min.) – 18 inch x 24 inch(max.)
Dryfilm thickness	1.5mil
Copper thickness	1/2oz
Line space	1mil/1mil on 12um copper thickness
Panel Material	Kapton
Elec. & control	
Power Supply	3 PH+PE+N 480V 60Hz

2. Machine Process

Pos.	Description	Module L (mm)	Process L (mm)	Process T (Sec.)	Temp. (°C)	Material
1	Input	650				PP / Ti
2	Etching	2200	1918	115.08	50°C	PP / Ti
3	Intermittent	750	468	28.08		PP / Ti
4	3 stage cascade rinse	1050	3 x 168	3 x 10.08	RT	PP / Ti
5	Blow off	300				PP / Ti
6	Inspection	1000				PP / Ti
7	Stripping	1900	1618	97.08	50-55°C	PP / SS
8	Post-Strip	600			30°C	PP / SS
9	3 stage cascade rinse	1050	3 x 168	3 x 10.08	RT	PP / SS
10	Anti tarnish	600	318	19.08	RT	PP / SS
11	2 stage cascade rinse	750	2 x 168	2 x 10.08	RT	PP / SS
12	Dryer	1250			60-80°C	PP / SS
13	Output	650				PP / SS
Total:		12750				

RT: Room Temp.

3. Technical Data

Pos.	Description	Water L/Hr.	City. Water L/Hr.	DI water L/Hr.	Exhaust CMM	Comp. Air L/Hr.	Power kW
1	Input				5		0.75
2	Etching	15	1080		5	100	16.85
3	Intermittent				5	150	0
4	3 stage cascade rinse	250				150	5.25
5	Blow off				10		3.0
6	Inspection						0.75
7	Stripping	15	1080		5	100	31.8
8	Post-Strip	15	1080		5	100	4.25
9	3 stage cascade rinse	250				150	2.25
10	Anti tarnish				10		1.1
11	2 stage cascade rinse			250		150	3.75
12	Dryer				10		17.8
13	Output						0.75
Total		545	3240	250	55	900	88.3

Note: Budget total power: 100.0kw

4. Process

Drive system

Drive motor: 0.75kw

Piping system

Drain: D32mm

Utilities

Power consumption: 0.75kw

Exhaust: 5CMM, d110mm(including Damper)

Note

Stand by sensor: 2

Emergency stop button: 1

Note: Panel jam alarm system.

Module

Side window: 8mm, tempered glass
 Volume: 680L

Drive system

Squeeze roller: Φ 32mm, PP/Ti, 4sets

Spray system

Nozzle: FAN quick lock, PP, 224pcs.
 Nozzle pressure /flow: 45PSI, 3.0L/min, individual spray bar adjustment for top spray pipes.
 Bottom spray manifold can adjustable
 Nozzle array: 8pcs. nozzles each pipe, spray manifolds are diagonally offset, installation of top/bot. spray manifolds are offset
 Spray manifold: PP, welded construction top/bot. 2sets, top/bot. 14 pcs. spray pipes
 Oscillator: horizontal oscillation 30 times/min, 40mm swing
 Oscillator motor: 2 x 0.1kw(frequency control)
 Digital pressure gauge: 16pcs. 0-6kg/cm²
 Pump: 4.0kw x 2
 Circulation pump: 0.75kw x 1

Filtration system

Filtration cartridge: Candle filter, PP, 7*20" candle core
 Filtration cartridge for circulation: Bag filter, Carbon, 1pcs.

Temp. Control System

Heater: Ti, 4.0kw x 6
 Cooling coil: Ti, D25mm, 12m x 1; L
 Temp. control: 2pcs. PT100, PVDF, temp. sensor
 Pneumat. valve: 1pcs.

Exhaust system

Condenser: D500*1, including pneumatic valve and pipework

Piping system

Water inlet: D32mm
 Drain: D50mm
 Overflow: D63mm

Utilities

Cooling water: 1080L/Hr.
 Power consumption: 32.75kw
 White fluorescent lamp: 4pcs.
 Compressed air: 100L/Hr.
 Exhaust: 5CMM, d110mm(including Damper)

Note: Intet rollers at Etching with misting system to avoid crystallization.

Module

Top Lid: 8mm; double side tempered glass

Drive system

Squeeze roller: Φ 32mm, PP/Ti, 4 sets

spray system

Nozzle: FAN quick lock, PP, 33pcs.
 Nozzle pressure: 28.5-35.5PSI
 Nozzle array: interlaced arranged ,triangular, nozzles on top spray pipe is 6/5/4/3/2 pcs. offset array. and on two bot. spray pipe is 7/6pcs. array
 Spray manifold: PP spray pipe, top 5pcs. and bottom 2pcs.
 Pneumat. Valve: 7pcs. (on each spray pipe)
 Spray pump: from Pos.3 circulation pump

Blow system

Blowpipe: Φ 10mm. 1pcs.
 Ball valve: D32mm. 1pcs.
 Blower: Bypass from Pos.4

Piping system

Overflow: D63mm (to Pos.3)

Utilities

Compressed air: 150L/Hr.
 Exhaust: 5CMM, d110mm(including Damper)

Module

Top Lid: 8mm; tempered glass
Volume: 60-79-69L

Drive system

Squeeze roller: Φ 32mm, PP/Ti, 10 sets

Spray system

Nozzle: FAN quick lock, PP, 39 pcs.
Nozzle pressure / flow: Max 21 PSI, 2.12L/min, top/bot. adjustable
Nozzle array: Top 7/6 nozzles offset array; Bot. 6/7 nozzles offset array;
Spray manifold: PP spray pipe, top/bot. 3 pcs. Spray pipes
Pressure gauge: 6pcs. 0-4kg/cm²
Flow meter: 2pcs.(one for bypass to Pos.02)
Pneumatic valve: 2pcs.(one for bypass to Pos.02)
Spray pump: 0.75kw x 3

Filtration system

Filter net: 3 pcs.

Blow system

Blowpipe: Φ 10mm, 4pcs.
Ball valve: D32mm, 4pcs.
Blower: 3.0kw, Bypass to Pos.3

Piping system

Water inlet: D20mm
Drain: D40mm
Overflow: D50mm(bypass to Pos.02)

Utilities

Power consumption: 5.25kw
Water inlet: 250L/Hr.
Compressed air: 150L/Hr.

Module

Module material: PP, temp. max. 65°C
 Top Lid: 8mm; tempered glass

Drying system

Blower: 3.0kw x 1
 Air knife: FK air knife 1 set

Piping system

Drain: D32mm

Utilities

Power consumption: 3.0 kw
 Exhaust: 5CMM, d110mm(incl. adjustment valve)

Drive system

Drive motor: 0.75kw x 1

Piping system

Drain: D32mm

Utilities

Power consumption: 0.75kw

Note

Stand by sensor: 4
 Emergency stop button: 1

Note: Panel jam alarm system.

Module

Module material: SUS316 outer PP, temp. max. 85°C
 Top Lid: 8mm; double layer tempered glass
 Volume: 565L

Drive system

Squeeze roller: Φ 32mm, PP/SUS316, 4 sets

Spray system

Nozzle: FAN quick lock, SUS316, 182pcs.
 Nozzle pressure / flow: 45PSI , 3.3L/min, top/bot. adjustable
 Nozzle array: 7/6 nozzles offset spray
 Spray manifold: SUS316, top/bot. 14 pcs. each
 Digital pressure gauge: 2pcs. 0-7kg/cm²
 Spray pump: 5.5kw x 2

Temp. control system

Heater: SUS316, 4.0kw x 5
 Cooling coil: SUS316, D25mm, 12m; L
 Temp. control: 2pcs. PT100, SUS316, temp. sensor
 Pneumat. valve: 1pcs.

Residue seperating system

High flow resist filtration 1Pcs, Filter net:180 μ m
 Residue Pump PP/EPDM, Air pump
 Circulation pump SUS316/EPDM, 0.8kw x 1
 Air pump PE/EPDM, 1pcs.

Piping system

Water inlet: D32mm
 Drain: D50mm
 Overflow: D63mm (from Pos.08)

Utilities

Power consumption: 31.8kw
 Cooling water: 1080L/Hr.
 Compressed air: 100L/Hr.
 Exhaust: 5CMM, d110mm(incl. adjustment valve)

Module

Cover: 8mm, double layer tempered glass
 Volume: 105L

Drive system

Squeeze roller: Φ 32mm, PP/SUS316, 4 sets

Spray system

Nozzle: FAN quick lock, SUS, 26pcs.
 Nozzle pressure /flow: 14-28.5 PSI, 2.6L/min, top/bot. adjustable
 Nozzle array: 7/6 nozzles offset array
 Spray manifold: SUS, top/bot. 2 pcs. spray pipes
 Digital pressure gauge: 2pcs. 0-4kg/cm²
 Pump: 1.1kw x 1

Filtration system

Filtration Cartridge: Bag filtering 1pcs, PP, 100um

Temp. Control System

Heater: SUS316, 3.15kw x 1
 Cooling coil: SUS316, D25m, 5m; L
 Temp. control: 2pcs. PT100, SUS316, temp. sensor
 Pneumat. Valve: 1pcs.

Blow system

Blowpipe: Φ 10mm. 1pcs
 Ball valve: D32mm, 1pcs
 Blower: Bypass from Pos.11

Piping system

Water inlet: D32mm
 Drain: D50mm
 Over flow: D63mm(to Pos.07)

Utilities

Water inlet: 15L/Hr.
 Cooling water: 1080L/Hr.
 Power consumption: 4.25kw
 Compressed air: 100L/Hr.
 Exhaust: 5CMM, d110mm (including Damper)

Module

Top Lid 8mm; tempered glass
 Volume: 60-79-69L

Drive system

Squeeze roller: Φ 32mm, PP/SUS316, 10 sets;

Spray system

Nozzle: FAN quick lock, PP, 39 pcs.
 Nozzle pressure / flow: Max 21PSI , 2.12L/min, top/bot. adjustable
 Nozzle array: Top 7/6 nozzles offset array; Bot. 6/7 nozzles offset array;
 Spray manifold: PP spray pipe, top/bot. 3 pcs. Spray pipes
 Pressure gauge: 6pcs. 0-4kg/cm²
 Pneumatic valve: 1pcs.
 Flowmeter 1pcs.
 Spray pump: 0.75kw x 3

Filtration system

Filtration Cartridge: Candle filtering 3pcs, PP, 2*10" filter core

Blow system

Blowpipe: Φ 10mm. 4pcs
 Ball valve D32mm, 4pcs
 Blower: Bypass from Pos.11

Piping system

Water inlet: D20mm
 Drain: D40mm
 Overflow: D50mm

Utilities

Power consumption: 2.25kw
 Compressed air: 150L/Hr.
 Water inlet: 250L/Hr.

Module

Cover: 8mm, double layer tempered glass
Volume: 105L

Drive system

Squeeze roller: Φ 32mm, PP/SUS316, 4 sets

Spray system

Nozzle: FAN quick lock, PP, 26pcs.
Nozzle pressure /flow: 14-28.5 kg/cm², 2.45L/min, top/bot. adjustable
Nozzle array: 7/6 nozzles offset array
Spray manifold: PP, top/bot. 2 pcs. spray pipes
Digital pressure gauge: 2pcs. 0-4kg/cm²
Pump: 1.1kw x 1

Blow system

Blowpipe: Φ 10mm. 2pcs.
Ball valve: D32mm, 2pcs.
Blower: Bypass from Pos.11

Piping system

Water inlet: D32mm
Drain: D50mm
Over flow: D63mm

Utilities

Water inlet: 15L/Hr.
Power consumption: 1.1kw
Exhaust: 10CMM, d110mm (including Damper)



Module

Top Lid 8mm; tempered glass
Volume: 60-64L

Drive system

Squeeze roller: Φ 32mm, PP/SUS316, 7 sets;

Spray system

Nozzle: FAN quick lock, PP, 13 pcs.
Nozzle pressure / flow: Max 21PSI, 2.12L/min, top/bot. adjustable
Nozzle array: top 7 nozzles array; Bot. 6 nozzles array;
Spray manifold: PP spray pipe, top/bot. 1pcs. Spray pipes
Pressure gauge: 2pcs. 0-4kg/cm²
Spray pump: 0.75kw x 1

Spray system(the last stage)

Nozzle: FAN quick lock, PP, 8pcs.
Nozzle pressure / flow: 0-1.0 kg/cm², 0.6L/min.
Nozzle array: spray pipe with 4pcs. nozzles
Spray manifold: top/bottom 1pcs. spray pipe
Flow meter: 1pcs.
Pneumatic valve: 1pcs.

Filtration system

Filter net: 2pcs.

Blow system

Blowpipe: Φ 10mm. 3pcs.
Ball valve: D32mm, 3pcs.
Blower: 3.0kw, Bypass to Pos.8, Pos.9, Pos.10

Piping system

Water inlet: D20mm
Drain: D40mm
Overflow: D50mm

Utilities

Power consumption: 3.75kw
Compressed air: 150L/Hr.
Water inlet: 250L/Hr.(DI water)(directly to the last stage spray pipes)

Module

Module material: SUS316 out PP, temp. max. 85°C
 Top Lid: 8mm; tempered glass

Drying system

Blower: 3.0kw x 3(frequency control the three bolweres for FK air knife);
 2.2kw x 1
 Air knife: FK air flow knife 2 sets; air shower 2sets
 Heater: 1.1kw x 6

Piping system

Drain: D32mm

Utilities

Power consumption: 17.8 kw
 Exhaust: 10CMM, d110mm (incl. adjustment valve)

Drive system

Drive motor: 0.75kw

Piping system

Drain: D32mm

Utilities

Power consumption: 0.75kw

Note

Stand by sensor: 2
 Emergency stop button: 1

NOTE: Panel jam alarm system.

- Central control cabinet
- Visualization software with PC

- 1. Over temperature protection
- 2. Temp. control
- 3. Lid open/close protection
- 4. Dry running protection
- 5. Filtering cartridge switching protection
- 6. Emergency stop switching protection
- 7. Stepping activation (Pumps & Blowers)
- 8. Water/power saving
- 9. Pre-heating
- 10. Three-color-lamp+ alarm
- 11. Production output statistics
- 12. Failure info and other standard displays

1. Stripping dosing system (central supply)
 - dosing box: 5L x 2; (one for chemical solution, one for water)
 - pneumatic valve: 1 pcs. ball valve: 1 pcs.
 - dosing mode: dosing by Conductivity controller (the conductivity install in main Develop module)
2. Anti tarnish dosing system (central supply)
 - dosing box: 5L x 1;
 - pneumatic valve: 1 pcs.
 - dosing mode: dosing by time
3. Stripping anti-foam dosing system (manual filling)
 - dosing tank: 50L x 1
 - dosing pump: 1 pcs. level switch x 2; L, LL
4. All chemical modules use Digital pressure gauge, and show pressure reading in PSI.
5. Etching regeneration system: AQUA-710
6. Catwalk and central piping

Operation manual in English 3 sets.