



ISO 9001:2008  
Certificate No.: FM 51875



Model : 17DES15DNAA09

Date : 15-Jun-17

## DES Machine

### (A) SCHEMATIC

Input ⇒ Developing ⇒ Fresh-Solution ⇒ Waste WR/S ⇒ Cascade WR/S(1)(2)(3)  
 ⇒ Drying Module(1)⇒Inspection(1) ⇒ Precision-Etching(1)(2)  
 ⇒Cascade WR/S(4)(5)(6)⇒Inspection(2)⇒Film Stripping⇒ Waste WR/S  
 ⇒Cascade WR/S(7)(8)(9)⇒Drying Module(2)⇒Output

### (B) SPECIFICATIONS

- 1) Outer dimensions: 19670mm L ×2538mm W ×3000±25 mm H
- 2) Panel size:
  - i) 610mm×610 mm [Max]
  - ii) 200mm×200 mm [Min]
  - iii) 0.05~3.2 mm [Thickness] [Not include copper]  
[ Rigid]  
0.05~ 1.6 mm [Thickness] [FPC]
- 3) Conveyor speed: 1 ~ 7m/min [adjustable] [Operation Speed: 1.5m/min]
- 4) Conveyor height: 1100±25mm
- 5) Conveyor width: 760mm [Effective width 630mm]
- 6) Roller diameter: Ø32 mm
- 7) Roller distance: 25 mm
- 8) Power supply  
Requirement: 3Phase 380V AC 50Hz 118.1kW (rated)  
(Power of heater: 58KW)
- 9) Power consumption: 50.7~62.5kWh
- 10) Water consumption: 18~30 L/min [Fresh Water]  
97 L/min [Cooling Water]  
Pressure of cooling water (water in):2.0~3.0bar,  
Temperature (water-in):8~10°C
- 11) Exhaust capacity: 12.6m<sup>3</sup>/min [Non-Drying Module]  
16.8m<sup>3</sup>/min [Drying Module]
- 12) Control box: Use PLC control and Touch Screen Display



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13) Input direction: From left to right [Front View]

14) Exhaust pipe Quantity: 3 in total

15) Drainage Pipe Quantity: 3 for chemical, 1 for water, 4 in total

16) Remark:

1. The tolerance for machine outer dimensions is  $\pm 100\text{mm}$
2. The <Panel Transportation Report> acts as an acceptance criteria
3. Input Module of the machine is installed with device of speed adjustment and display
4. Precision Etching Spraying Pumps are equipped with Constant Spraying Pressure System, and Pumps for Venturi Nozzles are equipped with Inverters for adjustment
5. Developing pump is equipped with inverter
6. PI core ,H/H oz copper, With 10mm length away from the panel edge, Adjust proper spraying pressure according to the thickness of the board
7. The surface of workpiece must be smooth, and round its corners
8. When flexible boards bend more than 2 mm, it is necessary to add backing panel or leading panel according to actual needs
9. When flexible board is single-side copper of  $T \leq 0.05\text{mm}$ , Add leading board when transporting boards
10. When flexible board is double-side copper of  $T \geq 0.05\text{mm}$ , normally transport boards
11. CE declaration
- 12 Equipped with 1set step down transformer (415V-380V)
13. Equipped with 10mmT PVC drip tray
14. Equipped with 1set UCE S.G. controller ,
15. Offer two volumetric pumps for Oxidant and Acid dosing
16. Developing and film stripping chemical are dosed by panel counting
17. Etching module is equipped with a waste transferring pump
18. Adjust proper working speed when process 50um dry film



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**(C) CHEMICAL WATER DATA (ONLY FOR REFERENCE)(COUNTED BY 1.5M/MIN)**

- |                       |        |                           |           |
|-----------------------|--------|---------------------------|-----------|
| 1) Developing:        | 52sec  | (effective length:1300mm) | (28~32°C) |
| 2) Fresh-Solution:    | 11sec  | (effective length:280mm)  | (28~32°C) |
| 3) Precision Etching: | 123sec | (effective length:3100mm) | (48~52°C) |
| 4) Film Stripping:    | 60sec  | (effective length:1500mm) | (50~55°C) |

**(D) CAPACITY (ONLY FOR REFERENCE)(COUNTED BY 1.5M/MIN)**

- |                        |   |                       |  |
|------------------------|---|-----------------------|--|
| 1) Panel Size:         | total output based on 18" x 24" (460mm x 610mm) |                       |  |
| 2) Distance:           | 50mm between of each                            |                       |  |
| 3) Operation Speed:    | 1.5m/min  |                       |  |
| 4) Output (pcs/hour):  | 1500mm÷(460+50)mm×60min                         | 176pcs/hour           |  |
| 5) Output (pcs/day):   | 176pcs×20hours                                  | 3520pcs/day           |  |
| 6) Output (pcs/month): | 3520pcs ×26days                                 | 91520pcs/month        |  |
| 7) Output (ft2/month): | 91520×3.0ft2×80%                                | about 219600ft2/month |  |



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**(E) MODULES:**

	Module	Length (Effective)	Capacity (Liter)	Body Material	Spray System									
					Pump /(Blower*)		Pressure (Bar)	Press roller		Spray bar /(Brush▲) /(Air knife*)			Nozzle	
					Power (HP)	Qty		Qty (Pair)	Material	Up	Down	Material	Qty (Pair)	Material
1	Input	732	-	UPVC	-	-	-	-	-	-	-	-	-	-
2	Developing	1839 (1300)	620	UPVC	7.5	1	0.5~2.8	-	PP	8	8	UPVC	Fan	132
3	Fresh-Solution	583 (280)	150	UPVC	1	1	0.5~1.3	-	PP	2	2	UPVC	Fan	32
4	Waste WR/S	1642	-	UPVC	-	-	-	-	-	1	-	UPVC	Fan	6
	Cascade WR/S (1)		50		1	1	0.5~1.3	-	PP	2	2	UPVC	Fan	40
	Cascade WR/S (2)		50		1	1	0.5~1.3	-	PP	2	2	UPVC	Fan	40
	Cascade WR/S (3)		50		1	1	0.5~1.3	-	PP	2	2	UPVC	Fan	40
5	Drying Module(1)	1379	-	SST	5.5HP*	1	-	-	-	1*	1*	SST*	-	-
			-		0.95kw*	1	-	-	-	3*	3*	SST*	-	-
6	Inspection(1)	996	-	UPVC	-	-	-	-	-	-	-	-	-	-
7	Precision-Etching(1)	1784 (1100)	560	UPVC	7.5	1	0.5~2.8	-	PP	7	7	UPVC	Fan	196
8	Precision-Etching(2)	2879 (2000)	1045	UPVC	7.5	2	0.5~3.0	-	PP	12	12	UPVC	Fan	336





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Continual :

	Module	Filtration System					Thermostat System			Exhaust		Remark
		Filter Material	Filter Qty	Core Precision	Core Qty	Filter	Heater Cooler	Material	Thermostat	Diameter	Qty	
1	Input	-	-	-	-	-	-	-	-	-	-	Photoelectric Sensor ×1Set Emergency Stop×1Set
2	Developing	PP	1	-	7	Cartridge	9KW × 1pcs Ø19mm × 10m	SST SST	Digital	Ø3"	2	Overheat protection × 1Set 1HP De-Foam Pump×1set Φ2"×30"L7pcs cartridge filters prepared by buyer Oil-sucking cotton
3	Fresh-Solution	UPVC	1	-	3	Cartridge Tank	4KW × 1 pcs Ø19mm × 6m	SST SST	Digital	Ø3"	1	Overheat protection × 1Set Φ2"×10"L3pcs cartridge filters prepared by buyer



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International supplies

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	Module	Filtration System				Thermostat System			Exhaust		Remark	
		Filter Material	Filter Qty	Core Precision	Core Qty	Filter	Heater Cooler	Material	Thermostat	Diameter		Qty
4	Waste WR/S	-	-	-	-	-	-	-	-	-	2-15L/min Flow meter×1Set	
	Cascade WR/S (1)	UPVC	1	-	6	Cartridge	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer	
	Cascade WR/S (2)	UPVC	1	-	6	Cartridge	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer	
	Cascade WR/S (3)	UPVC	1	-	6	Cartridge	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer 2-15L/min Flow meter×1Set Ø1/2" Solenoid valve x1Set Flux 6-10L/min Sponge Squeeze (2 top/2bottom)× 1Set Immersion trough of Sponge Squeeze x1set	
5	Drying Module(1)	-	1	5µm+0.3µm	-	Air Filter	-	-	-	Ø4"	1	HEPA Filter
		-	1	5µm+0.3µm	-	Air Filter	3kW×2pcs	SST	Digital	Ø4"	1	Overheat protection × 1Set HEPA Filter
6	Inspection(1)	-	-	-	-	-	-	-	-	-	-	Emergency Stop×1Set
7	Precision Etching(1)	UPVC	1+1	*µm + 60Meshes	4+1	Cartridge + Pump	9KW×1pcs Ø19mm×10m	Ti Ti	Digital	Ø3"	1	Overheat protection × 1Set 5.5HP Circulation Pump × 1Set 3HP vacuum pump×1Set Φ2"×30"L4pcs cartridge filters prepared by buyer Oil-sucking cotton





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	Module	Filtration System				Thermostat System			Exhaust		Remark	
		Filter Material	Filter Qty	Core Precision	Core Qty	Filter	Heater Cooler	Material	Thermostat	Diameter		Qty
8	Precision Etching(2)	UPVC	2+2	*µm + 60Meshes	8+2	Cartridge + Pump	12KW × 1pcs Ø19mm × 20m	Ti Ti	Digital	Ø3"	2	Overheat protection × 1Set 7.5HP vacuum pump×1Set Φ2"×30"L8pcs cartridge filters prepared by buyer Oil-sucking cotton Φ2"×20"L3pcs cartridge filters prepared by buyer
9	Cascade WR/S (4)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer
	Cascade WR/S (5)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer
	Cascade WR/S (6)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer 2-15L/min Flow meter × 1Set Ø1/2" Solenoid valve x1Set Flux 6-10L/mi
10	Inspection(2)	-	-	-	-	-	-	-	-	-	-	Emergency Stop×1Set 24"Lamp × 2Sets t
11	Film Stripping	PP	1	30 meshes	1	Pump+ Barrel roll	12kW×1pcs Ø19mm×6m	SST SST	Digital	Ø3"	3	Overheat protection×1Set





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	Module	Filtration System					Thermostat System			Exhaust		Remark
		Filter Material	Filter Qty	Core Precision	Core Qty	Filter	Heater Cooler	Material	Thermostat	Diameter	Qty	
12	Waste WR/S	-	-	-	-	-	-	-	-	-	-	2-15L/min Flow meter×1Set
	Cascade WR/S (7)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer
	Cascade WR/S (8)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer
	Cascade WR/S (9)	UPVC	1	-	6	Cartridge	-	-	-	-	-	Φ2"×10"L6pcs cartridge filters prepared by buyer 2-15L/min Flow meter × 1Set Ø1/2" Solenoid valve x1Set Flux 6-10L/min Sponge Squeeze (2 top/ 2 bottom) × 1Set Immersion trough of Sponge Squeeze x1set
13	Drying Module(2)	-	1	5µm+0.3µm	-	Air Filter	-	-	-	Ø4"	1	HEPA Filter
		-	1	5µm+0.3µm	-	Air Filter	3kW × 2pcs	SST	Digital	Ø4"	1	Overheat protection × 1Set HEPA Filter
	Output	-	-	-	-	-	-	-	-	-	-	Emergency Stop × 1Set Static electricity removal x1Set



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Remarks:

Basic spare parts will be provided for maintenance used (1 set)  
\*The following items in the table are 1 Set Package

No.	Part No	Item	Specification	Qty
1	40010200462	Gray Sector Nozzle Core	UCE-242-2	10PCS
2	40010200881	Fan Nozzle Cover	UCE-777-1	10PCS
3	20010713046	O-Ring of Quick Spray Nozzle	OD18mmxID12mmx3mmH	10PCS
4	20010713269	O-Ring of Spray Bar	25 x 4H(mm)	4PCS
5	40010301703	O-Ring of Top Cover	UCE-X085	5PCS
6	30071003002	Sleeve of Conveyor Bearing (out)	Φ 30x29.4mm	5PCS
7	30071004009	Sleeve of Conveyor Bearing (in)	UCE-131(process)	5PCS
8	20032810011	Fuse	2A	3PCS
9	20032810012	Fuse	3A	3PCS
10	20032810004	Fuse	5A	3PCS
11	20032810005	Fuse	8A	2PCS
12	20032810006	Fuse	10A	2PCS
13	20031301153	Contacto	SC-E05	1PCS
14	20020911004	Full Hook	35B	4PCS
15	20020910004	Half Hook	35B	4PCS
16	20031225086	Magnetic Switch	DS-1561	2SETS
17	40014101253	Key	UCE-178A-1	2PCS
18	30060102039	Level Switch	PP Pipe=289.5mm	2PCS
19	40010208104	6" O-Ring of Top Cover	UCE-X044-1	5PCS
20	30060102041	Adjustable Level Switch	OD33 x 300L	2PCS
21	30190501081	Mercury Switch	1.5m	1PCS
22	20031291002	Overheat Protection of Heat	250V5A	2PCS
23	30031601651	Micro Switch component	UCE-247A/B/C/D/E	2PCS
24	20010903020	G3 Grade Air Filter	190mmx410mmx69mm	1PCS
25	20010905008	HY High Efficiency Filter	190mmx410mmx120mm	1PCS
26	20010903031	GT Grade Air Filter	430mmx280mmx46mm	1PCS
27	20010905006	HYTI High Efficiency Filter	430mmx280mmx150mm	1PCS
28	30332116152	304#SUS Movable platform	Frame+Wheel+Plate/assembl	1PCS
29	40010101331	Green Lock Union	UCE-295A+295B	5SETS
30	40010102601	Main Conveyor Gear	UCE-298A-1	10PCS



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31	40010102651	Roller Axis gear	UCE-298B-1	10PCS
32	40010102191	Straight Gear	UCE-482	5PCS
33	30110403011	H Cover	ID10	4PCS
34	40010103602	Roller Stand	UCE-481C-1	5PCS
35	30110400101	Stand(metal module)	UCE-481C-1 +359	5PCS
36	30011000071	Clip Nozzle Stand	UCE-233A/B	5PCS
37	10040301253	Woven bag	1100mmLx750mmW	10PCS
38	39990401141	Ti Transmission Shaft Connector	Φ 32x34mm (connectors A/B +	1SET
39	20021903005	PP Diaphragm Pressure Gauge	0-7kg/cm <sup>2</sup>	1PCS
40	40054100221	Hose(etching)	ID15.5mmx1.5mmtx530mm	2PCS
41	40054100223	Hose(etching)	ID15.5mmx1.5mmtx510mm	2PCS
42	40010207753	11"O-Ring of Top Cover	UCE-X066	1PCS
43	40054100221	Hose(developing module)	ID15.5mmx1.5mmtx470mm	2PCS
44	40054100222	Hose(developing module)	ID15.5mmx1.5mmtx530mm	2PCS



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## Panel Transportation Report(Rigid)

Panel thickness panel size	0.05~0.1(mm)	0.1~0.8(mm)	0.8~1.6(mm)	1.6~2.5(mm)	2.5~3.2(mm)
200x200(mm)	OK	OK	OK	OK	OK
350x350(mm)	OK	OK	OK	OK	OK
500x500(mm)	OK	OK	OK	OK	OK
610x610(mm)	OK	OK	OK	OK	OK

\*FR4 core ,H/H oz copper, With 10mm length away from the panel edge,Adjust proper spraying pressure according to the thickness of the board

\*\*"Normal Transportation" in table means normal production without board jam , shifting angle  $\leq 5$  degrees , shifting distance  $\leq 10$  mm every 10 m

\*The report acts as an acceptance criteria

\*The normal loading distance between each panel is 50mm.



## Panel Transportation Report(FPC)

Panel thickness panel size	0.05~0.1(mm)	0.1~0.8(mm)	0.8~1.6(mm)
200x200(mm) x 2Column	Shifted about 15mm Shifted about <8° ° Possible slight corner folding	Shifted about 15mm Shifted about <8°	Shifted about 15mm Shifted about <8°
610x610(mm) x 1 Column	Shifted about 10mm Shifted about <5° Possible slight corner folding;	Shifted about 10mm Shifted about <5°	Shifted about 10mm Shifted about <5° ;

- \*The report acts as an acceptance criteria
- \*PI core, H/H oz copper, With 10mm length away from the panel edge, Adjust proper spraying pressure according to the thickness of the board
- \*The surface of workpiece must be smooth, and round its corners.
- \*When flexible boards bend more than 2 mm, it is necessary to add backing panel or leading panel
- \*When flexible board is single-side copper of  $T \leq 0.05\text{mm}$ , Add leading board when transporting boards
- \*When flexible board is double-side copper of  $T \geq 0.05\text{mm}$ , normally transport boards
- \* For loading with single panel per row, Intervals reserved between panels should be  $\geq 50\text{mm}$  longitudinally, while double panels per row  $\geq 50\text{mm}$  longitudinally and transversally.



## Precaution

1. When cleaning the machine with SST material, do not use hydrochloric acid, vitriol can be used only if its concentration is less than 3%, UCE will not be responsible for replacement if corrosion of SST material is caused by using incorrect chemical.
2. Direct mixing of strong acid and alkaline in the main tank of the machine is forbidden.
3. It is forbidden to clean the high pressure rinse module with acid and alkaline, otherwise, the parts of high pressure pump will be corroded. UCE will not be responsible for replacement.
4. When using hydrochloric acid, the content of fluorine should be less than 10PPM. Otherwise, it will cause corrosion to the materials with titanium .UCE will not be responsible for it.
5. Inflammable fluid such as industrial alcohol is strictly prohibited for cleaning the machine during maintenance. Do not use high pressure water gun cleaning soft wheel disc.
6. Fresh air and cool air (temperature<25°C, relative humidity<55%, air flow rate: 5~8m<sup>3</sup>/min) should be inside electrical cabinet, UCE will not take responsibility for replacement if corrosion of metal materials in electronic unit is caused by client's inability to provide the conditions mentioned above.
7. Inspect the cooling fans of electrical cabinet and clean the filter nets periodically.
8. The exhaust air pipes cannot be connected with other exhaust pipes, UCE will not be responsible for replacement if the corrosion of pipe is caused by incorrect connection.
9. The environment in workshop should fit the condition for running the machine. If the conditions are not met, UCE will not responsible for the problems that may occur.
10. For the equipment which cooling water is required, please provide cooling water. Temperature: 10~15°C, pressure (water-in):2.0~3.0bar.
11. For the equipment which compressed air is required, please provide air source. Air pressure 5.0~7.0bar.
12. For the equipment which anti-oxidation is required, please use DI water or RO water to clean before drying.
13. Periodically inspect and clean the filters of cooling pipes.
14. It is necessary to wet or soak sponge rollers in water if the machine is not used frequently.
15. All the recognized specifications mentioned above exclude auxiliary equipment or facilities.