Panasonic

Subject No.			
Line No.		Line Position No.	

Plasma cleaner

Model ID : **PSX307**

Model No.: NM-EFP1A

Panasonic Factory Solutions Co., Ltd.

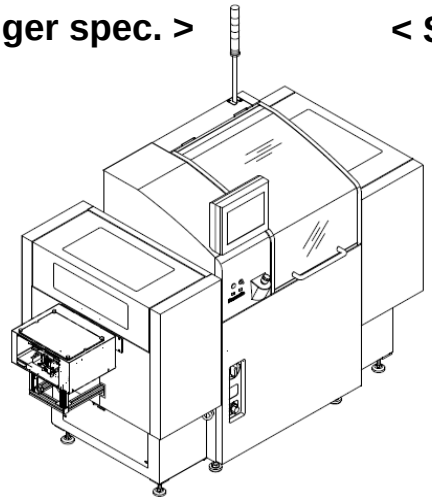
1. Specifications

Project No.	

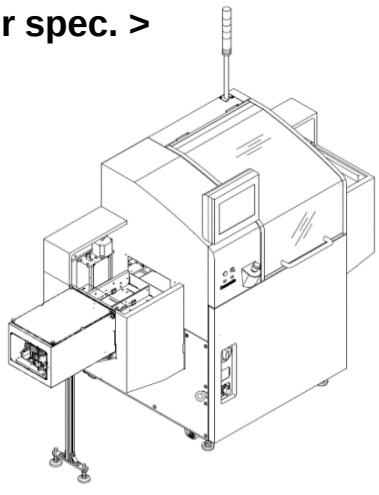
1.1 Standard Specifications

1	Electric Source	Rated voltage	• Single-phase: AC200 V±10 V • Single-phase: AC208 V±10 V • Single phase: AC220 V±10 V • Single-phase: AC230 V±10 V • Single-phase: AC240 V±10 V			
		Frequency	50 /60 Hz			
		Rated capacity	2.0 kVA (FULL LOAD 5.0 kVA)			
		• Much more than above capacity (5 kVA) is preferable as power source for the machine. • When a step down transformer is used, the secondary side must be more than 5 kVA. • The power source should be connected by 3-conductor cable of 5.5 mm2 (AWG #10) or over. A transformer switch on the machine has to be changed if the power source is other than 200 V. • There is no leakage detection function in this facility. When necessary, please request by individual specification.				
2	Pneumatic Source	Supply air pressure	0.5 MPa	Supply air amount	6.5 L /min	
	Ar, O_2 Gas Supply Plasma Discharge	Pressure	0.1 MPa to 0.15 MPa			
		Max. Consumption	0.1 L /min (Ar) : Standard configuration is Argon only. (Oxygen option: 0.2 L /min(O2)			
	N_2 gas supply (option) for diluting the oxygen gas	Pressure	0.05 MPa to 0.1 MPa			
		Max. Consumption	2 L /min			
3	Dimensions	•PSX307-S：W 2113 mm × D 1 100 mm × H 1 450 mm •PSX307-M：W 2266 mm × D 1 100 mm × H 1 450 mm（Single lifter specification） •The signal tower and the monitor are not included in the above dimension.				
4	Mass	Main body mass	• PSX307-S : 850 kg * Varies with machine configuration. (Changer specification) • PSX307-M : 725 kg *Varies with machine configuration. (Single lifter specification)			
5	Environment	Temperature	20 °C to 30 °C	Humidity	50 % to 70 % (no condensation)	
		Cleanliness	Less than Class 10 000 (exhaust dust required)			
6	Program	Storage capacity of HDD	Internal storage device: CFast 4GB Storage capacity : Max. 100 products			
		External storage device	USB port x 2（Ver,2.0）			
7	Others	Production management information • Time of auto-run : Information on auto-run time • Number of Processed board : Information on number of boards processed. • Error record: Error items and number of errors				
		• Substrate transfer: Rear fixed rail only • Pass line: 920mm from floor • Caster: • PSX307-S : 4 locations on the main unit, 2 locations on the loader/unloader • PSX307-M : 4 locations on the main unit • Fixing eyebolt for transportation: 4 locations (This machine does not accept lifting.)				

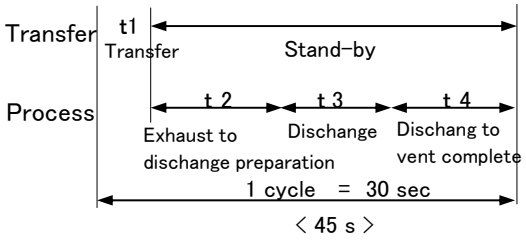
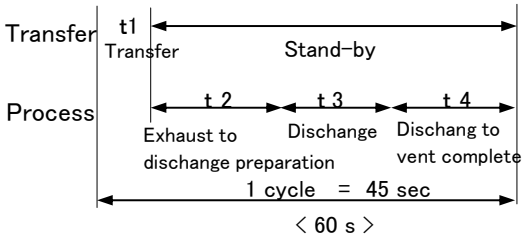
< Changer spec. >



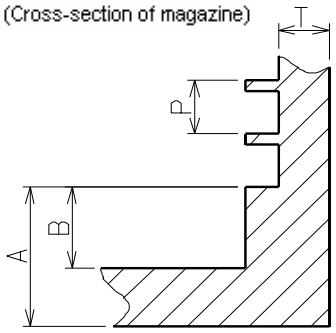
< Single lifter spec. >



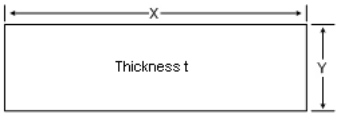
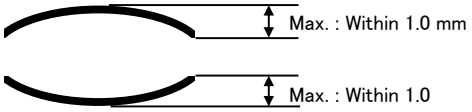
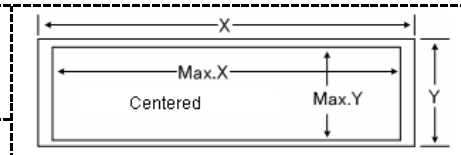
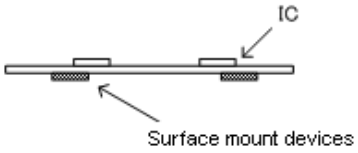
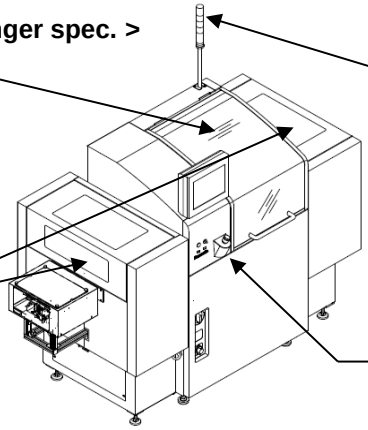
1.2 Standard Functions

1	Method	Plasma method	High-frequency parallel plate etching method
2	Cycle Time	<PSX307-S> * If 3 column spec PCB length is 120mm or less, 6 PCBs is processed at once. < > value is PCB length of 120mm or less.	30 s/cycle/3 PCBs 〈 45 s 〉/cycle/6 substrates  • Dry running without PCB • PCB length setting: 250 mm, 〈120 mm 〉 Others are the same condition. • Discharge time setting * Ar gas: 8 sec. * O_2 gas: 5 sec. • Gas flow rate setting * Ar gas: 5 ml /min * O_2 gas: 50 ml /min
		<PSX307-M> * If 2 column spec PCB length is 160mm or less, 4 PCBs is processed at once. < > value is PCB length of 160mm or less.	45 s/cycle/2 PCBs 〈 60 s 〉/cycle/4 substrates  • Dry running without PCB • PCB length setting: 330mm, 〈160 mm 〉 Others are the same condition. • Discharge time setting * Ar gas: 13 sec. * O_2 gas: 10 sec. • Gas flow rate setting * Ar gas: 5 ml /min * O_2 gas: 50 ml /min
		Remarks	• Process time and exhaust time depend on conditions of PCBs etched. (Size, material, etc) Confirm the cycle time with your own PCB. • Exhaust time of t2 might become longer due to out gas from processing PCB.
3	Change-over Time	Total	• PSX307-S : Max. 25 min • PSX307-M : Max. 15 min
		Work Descriptions	• Magazine mounting jig change (Process, work data and magazine data have already been input; the data loading time is excluded.) • Transport nail position adjustment • Front/Rear transport rail adjustment • Intra-chamber electrode replacement/adjustment • Position change of PCB pull-in nail

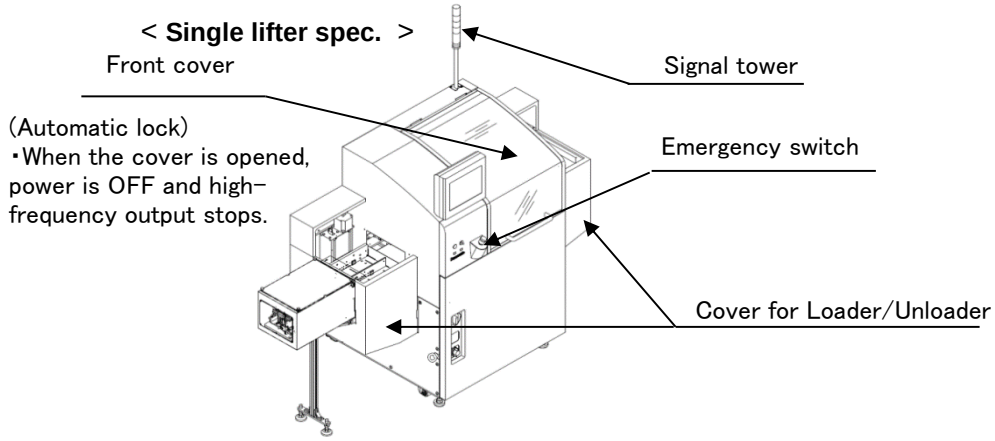
1.2 Standard Functions

4	PCB Supply/Stock	Magazine size	• W:30 mm to 80 mm (3 column) • W:30 mm to 125 mm (2 column) • L:100 mm to 260 mm (PSX307-S) • L:100 mm to 350 mm (PSX307-M Single lifter) • L:100 mm to 350 mm (PSX307-M Changer) • H:75 mm to 175 mm (Changer) • H:75 mm to 240 mm (Single lifter)	 Contact us for magazine sizes outside the applicable ranges shown left.
			• First-slot offset A= 15mm or more B= 9 mm or more	
		Lifter stroke	• PSX307-S : Max. 175 mm • PSX307-M : Max. 190 mm	
		Magazine data	Height to pitch, slot count and first-slot offset is set by data input.	
		Magazine stock	<Changer spec. For 3 column> Magazine at loader: 3 pcs. x 2series = 6 pcs. Magazine at Unloader: 3 pcs. x 2series = 6 pcs.	
			<Single lifter spec. For 2 column> Magazine at loader: 2 pcs., Magazine at Unloader: 2 pcs.	
		Loading	Loader :Bottom to top	
		Unloading	Unloader: Selectable from above and below	
5	Applicable Plasma Material	PCB	Glass epoxy, BT resin, Film, Ceramic, etc	
		Electrode	Au plating, Ni plating, Cu, etc	
		Surface film	Solder resist, etc • The material must be checked ahead of time when the carrier, etc. is to be used.	
6	Vacuum Chamber	Ultimate vacuum	Less than 3 Pa (In case that all parts in the chamber are new and there is no PCB in the chamber.)	
7	Rotary Pump	Exhaust speed	345 L/min (50Hz), 413 L/min (60 Hz) Oil mist eliminator is provided. Pump oil: Mineral oil (standard)	
			• When oxygen (option) is selected as the process gas, a hydrocarbon composite oil with enhanced resistance to acid is used as the pump oil. Care must be taken when maintenance is to be performed. • You should overhaul the pump periodically, and should replenish as needed and periodically replaced pump oil, and also replace oil mist eliminator filter regularly. Overhauling the pump as well as the oil and filters are not covered by the warranty.	
8	Mass-flow Controller	Ar	2.5 ml /min to 10 ml /min	
		O_2 (option)	10 ml /min to 100 ml /min	
			• Oxygen is an option. Depending on the boards to be processed, discharge may not be possible at the gas flow given on the left.	
9	High-frequency Power Supply (Matching box)	Output	100 W to 600 W	• Notification to pertinent authority on emissions required. (in Japan at least)
		Frequency	13.56 MHz	
		Matching	Fully automatic	
		Electrodes	Capacitance-coupled internal type	
10	Discharge Gas • Please provide gas, cylinder and pressure regulator specified at right, and also connect them to main body.	Gas	Ar: purity 99.999 % or better (Manufactured by NIPPON SANSO Corp. Pure argon B) O_2 : purity 99.99 % or better (option) (Manufactured by NIPPON SANSO Corp. Pure oxygen A)	
		Cylinder	Outer diameter φ1 / 4 inch SUS tube	
		Pressure regulator (Seamless type)	With stop valve Primary: 0 MPa to 25 MPa Secondary: -0.1 MPa to 0.3 MPa	
11	Safety Device	Alarm function	Machine alarm in the following cases, and the error message is displayed on the monitor. • Emergency stop • Air pressure drop • Process error • Transfer system error	

1.2 Standard Functions

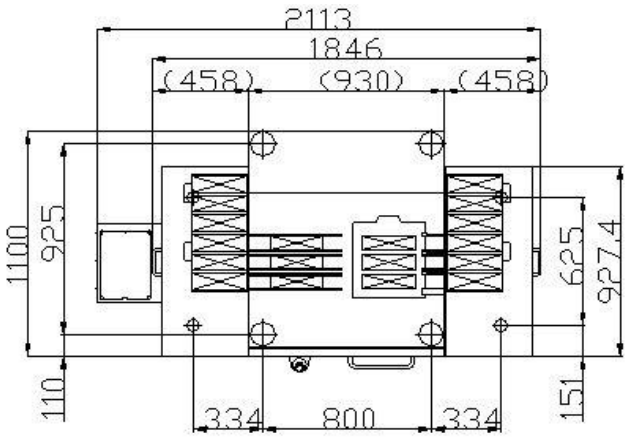
12	PCB Specification	PCB material	Polyimide, BT resin, Glass epoxy • The material must be checked ahead of time when the carrier, etc. is to be used.
		Etched material	Au (gold): plating /Ni (nickel): plating /Cu (copper)
		Removal materials	Metal oxides, hydroxides, organic matter
		PCB dimension	X = 50 mm to 250 mm (PSX307-M : X = 50 mm to 330 mm) Y = 20 mm to 75 mm *(PSX307-M : Y = 20 mm to 120 t = 0.5 mm to 2.0 mm Max. warpage = ±1.0 mm  • PCB should be flat, with no parts mounted on bottom side. • In some cases, no remedial action can be taken if the warpage exceeds the prescribed value even when the PCB size satisfies the above dimensions. Warpage（Cross section in board X and Y directions ）  • Please provide us with all the relevant information in advance. • In cases where the above warpage is exceeded, the skipped-level magazine specifications and pressure control process specifications for the plasma treatment are required, resulting in an extended tact time. It may not be possible to take any remedial action in some cases. * The electrode in the chamber is used exclusively from Y =70 mm to 75 mm.
		Process area	・PSX307-S：Max.X = 230 mm （PSX307-M：Max.X = 310 mm） ・PSX307-S：Max.Y = 50 mm （PSX307-M：Max.Y = 100 mm） 
		Type of chip	LSI, CMOS, etc.
		Remarks	• With film PCBs, we recommend using a carrier, plated with ceramic (with min. thickness of 20 μm). If you can not plate on the carrier, control the clearance between the PCB and carrier to less than 2 mm. Otherwise, the PCB may be damaged by spark.  • The back side of PCBs must be flat without any surface mount devices. If there are surface mount devices on the back side, you have to prepare the specific electrode and need to verify the quality. ・When thickness is below 0.5 mm, some options for handling thin substrate are required. ・Specific parts are required for the substrates such as very thin below 0.2 mm, or warping is more than 1 mm, or there are some components on the backside.
13	Safety Device (Changer spec.)	Signal tower	 ←Red: Error warning (Machine stops) ←Yellow: No work in the loader or full with work in the unloader (Machine stops) ←Green: Automatic operation • Changes to the settings for the lighting in each situation can be made from the touch panel.
			< Changer spec. > Front cover (Automatic lock) ・When the cover is opened, power is OFF and high-frequency output Signal tower Cover for Loader/Unloader (Automatic lock) ・When it is OPENED, a part of power shuts down and stops temporarily. Emergency switch 

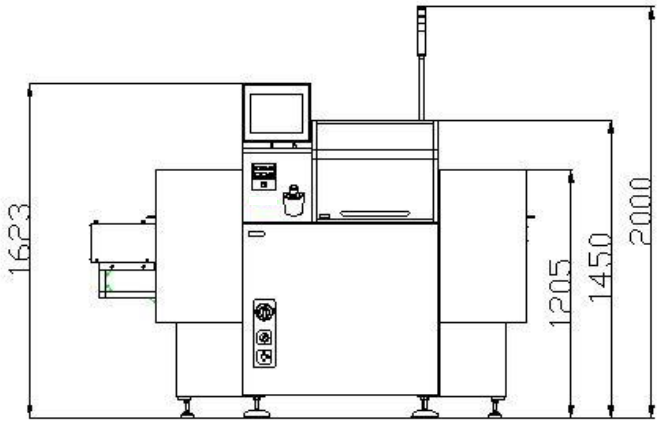
2.1 Safety Device

14	Safety Device (Single lifter spec.)	
15	Remarks	• If the cover opens while the current is applied, the machine stops by the safety sensor. • Power of some parts stops while the door of the loader/unloader opens. • It is very dangerous to bypass the safety sensors or to perform maintenance while the current is applied. You may be in danger of an electric shock, a burn, or an injury. (It is very hot in the chamber.) • The parts inside the chamber, such as electrodes, guide rails and shields, must be periodically cleaned up or replaced. (The guide line of replacement is every 100 hours of RF usage, but depends on your conditions.) • The vacuum pump must be overhauled once a year. (The frequency becomes every four months if the machine runs for 24 hours per day.) This frequency is a guide line, and depends on conditions. • The replacement and cleaning of the parts inside the chamber and the overhauling of the pump are not covered by the warranty even during the warranty period. • Please be sure to perform periodical maintenance, periodical parts exchange in chamber as well as oil change and overhaul of vacuum pump. Otherwise, problems may occur, such as slow down of exhaust speed, abnormal discharge, or trouble and oil leak of the pump. It's recommended to purchase another vacuum bump for backup during overhaul. • Interval of maintenance will become longer than written in the maintenance manual when the process time of plasma is set longer than standard. Please perform maintenance accordingly. • The cycle time becomes longer as the machine is used since the exhaust time becomes longer. This phenomenon varies depending on substrates and operation conditions. • In order to minimize increase of the exhaust time, the necessary maintenance must be performed as described in the Instruction Manual. • The standard pump oil (mineral oil) is flammable, and it readily deteriorates since it undergoes oxidization in the exhaust process. For this reason, do not use the standard mineral-base oil for any process applications in which oxidized gases are evacuated. When oxygen gas is to be evacuated, the mineral-base oil must be replaced with hydrocarbon-base oil, and the oxygen must be diluted by nitrogen gas. • When PSX307 is used for application of underfill improvement or other, oxygen gas is consumed a lot. In such cases, spare parts shown blow should be purchased in advance since some parts in the chamber and in the pump are degraded. (O-ring for the chamber, Main valve, Vacuum protection valve, Filter in vacuum pump) • CE certification by the third party is obtained on the PSX307 with the described options. When some customized options are added, the CE certification may need to be obtained again. Please ask us for more detail when CE mark is mandatory. ・There is no leakage detection function in this facility. When necessary, please request by individual specification.

2.2 Unit Layout (PSX307-S)

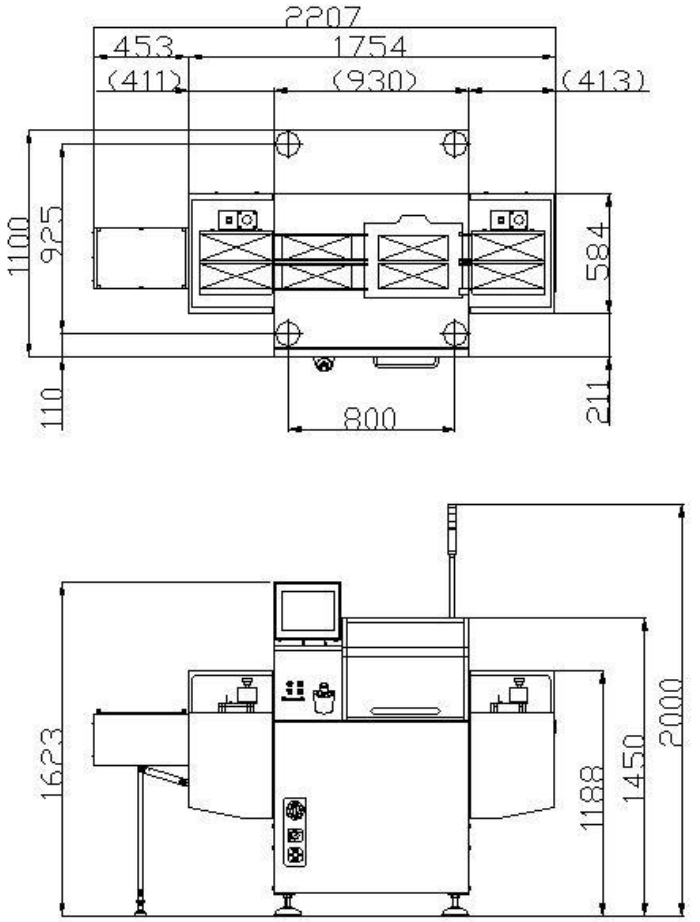
1	Unit Layout PSX307-S <Changer>	Unit: mm (tolerance of size±5)

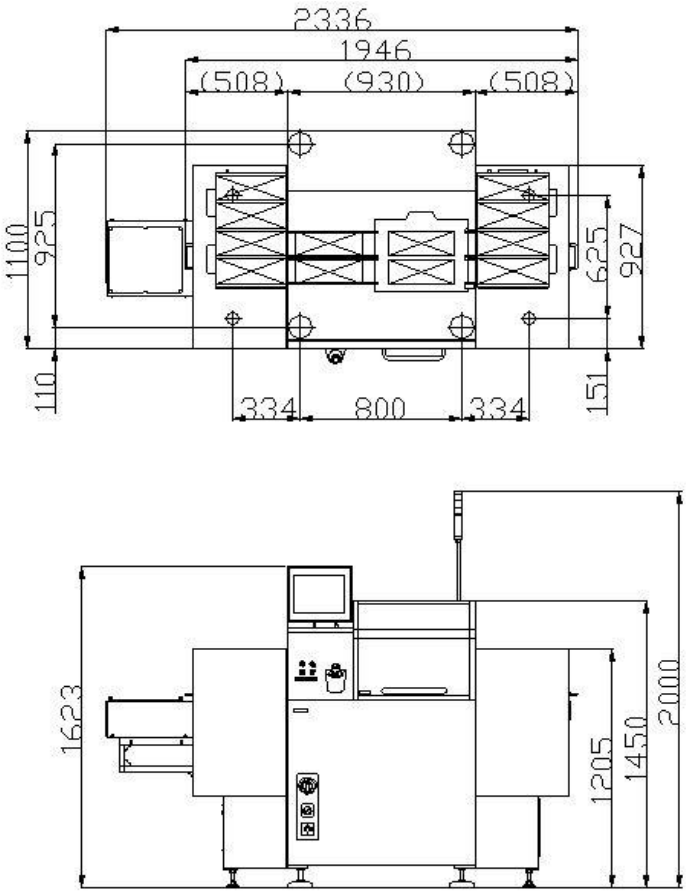




2.3 Unit Layout (PSX307-M)

2	Unit Layout PSX307-M < Single lifter >	Unit: mm (tolerance of size±5)
	PSX307-M < Changer >	





3. Option

Project No.	

3.1 Main Body Unit , Gas Supply Unit (Argon), and other options for S and M type

	Option name	Qty	Specifications
1	PSX307 general configuration		PSX307 main body [Standard specification] includes following specifications. • vacuum pump • Plasma gas (Ar) • USB memory • High-frequency unit: 600W • Touch panel • Transformer • Air piping • Load wiring:Main Unit Part • Signal tower • Control Unit(Power Unit , Safty Relay Unit) •Load wiring (chamber valve) • Control unit (RF Control unit) • Load wiring (Ar Gas Supply Section , Vacuum Pump)
2	Main Unit		
	○ PSX307-S Main Unit	[S Standard]	• PSX307-S Main Unit •Vacuum chamber ・Accessories • Single Adjustment
	◉ PSX307-M Main Unit	[M Standard]	• PSX307-M Main Unit •Vacuum chamber ・Accessories • Single Adjustment
3	Gas Supply Unit (Ar)		• Ar is [Standard specification] for gas to remove contaminants, that degrade quality of wire bonding, by physical energy.
	Additional options		
	○ Plasma gas 1 line (Ar)	[Standard specification]	Oil in the vacuum pump is specific for the Argon gas.
	☐ Stainless pipe (For Ar)		The stainless pipe between the gas cylinder and the mass flow controller of PSX307. (2 meters x 1 pc)
	◉ GPlasma gas 2 lines (Ar and O2		For additional Oxygen plasma application such as to improve mold adhesion by its surface reforming. Oil in the vacuum pump is used for both Ar and O2.
	☑ Stainless pipe （For Ar , O_2 and N_2 ）		The stainless pipes between the each gas cylinder (Ar, O2, N2) and the mass flow controller of PSX307. (2 meters x 3 pcs)
4	Vacuum pump		
	☑ Rotary pump	【Standard specification】	・Vacuum pump ・Load wiring(vacuum pump) ・For dry pump specification, make this box unchecked. Pump is to be supplied by the customer. Recommended pump：PDV500-GB(EBARA Corporation), NeoDry36E-2(Kashiyama Industries, Ltd.)
	☐ Spare rotary pump		*This is a spare pump at overhaul of a vacuum pump.
5	Other options for S and M type		
	Additional options		
	☑ Oil level sensor		Oil level in the vacuum pump is watched by a sensor and notify if it is short.
	☐ Option to improve underfill process		Argon and Oxygen can also be equipped even when this option is selected.
	☑ GEM Communication		For GEM communication with the host server. Detailed specification must be discussed and agreed. Any customized specification will be quoted separately.

3.2 S type options (Chamber Unit)

	Option name	Qty	Specifications
6	Chamber Unit (S type options)		• The chamber electrode guide is selected based on substrate thickness. The [Standard specification] is 1.5 mm Gap.
	Ceramic electrode in the chamber (S type)		
	☐ Universal type electrode in the chamber (S)	[S Standard]	The material is ceramic. For 20mm to 70mm width substrate, the electrode width is adjustable. For 70 to 75mm width substrate, the width is fixed. Thin substrate below 0.5mm is not applicable.
	☐ Customized electrode in the chamber (S)		The ceramic electrode of customized design. (Example: For thin substrate, protruded or untouchable area on bottom side) * Design of the customized electrode must be discussed in advance.
	Chamber electrode guide (S type)		
	☐ Chamber electrode guide for Thin Board Gap 1.5 mm (S)	[S Standard]	Material of the electrode guide is ceramic. Gap 1.5 mm : 0.5 mm = < substrate thickness < 1.0 mm
	☐ Chamber electrode guide for Thick Board (S)		• 1.0 mm = < t • Thick PCB, Straight guide; made of ceramic
	☐ Chamber electrode guide for Thin Board Gap 0.8 mm (S)		• Gap 0.8 mm : t < 0.5 mm • Overhang guide; made of ceramic
	Chamber cooling fan (S type)		
	☐ Chamber cooling fan (S)		The fan for cooling down the chamber to reduce substrate's warpage caused by long process time. (Specific for S type)

3.3 M type options (Chamber Unit)

	Option name	Qty	Specifications
7	Chamber Unit (M type options)		• The chamber electrode guide is selected based on substrate thickness. The [Standard specification] of the electrode guide is for thick type.
	Ceramic electrode in the chamber (M type)		
	☐ Universal type electrode in the chamber (M)	[M Standard]	The electrode is aluminum and is for substrate from 20 to 120mm width. Thin substrate below 0.5mm is not applicable.
	☑ Customized electrode in the chamber (M)		The ceramic electrode of customized design. (Example: For thin substrate, protruded or untouchable area on bottom side) * Design of the customized electrode must be discussed in advance.
	Chamber electrode guide (M type)		
	☑ Chamber electrode guide for Thick Board (M)	1	[M Standard] • 1.0 mm = < t: substrate thickness • Thick PCB, Straight guide; made of ceramic
	☐ Chamber electrode guide for Thin Board Gap 0.8 mm (M)		• Gap 0.8 mm : t < 0.5 mm • Overhang guide; made of ceramic
	☐ Chamber electrode guide for Thin Board Gap 1.5 mm (M)		• Gap 1.5 mm : 0.5 mm = < t < 1.0 mm • Overhang guide; made of ceramic
	Chamber cooling fan (M type)		
	☑ Chamber cooling fan（M）		The fan for cooling down the chamber to reduce substrate's warpage caused by long process time. (Specific for M type)

3.5 M type options (Substrate Transfer system)

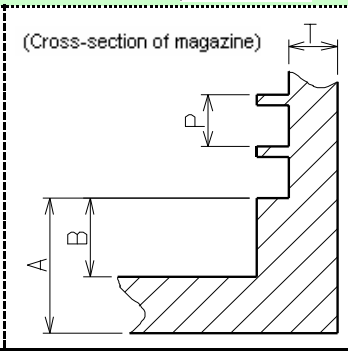
	Option name	Qty	Specifications	
10	Substrate Transport System (M type options)			
	Specification of transport system (M type)		If this is not selected, any substrate transport system is not equipped.	
	☑ Standard specification of transport system (M)		[M Standard]	Substrate indexer with wiring, substrate transporting claw, Pre and post transport rail with wiring for the chamber
	Substrate loading system (M type)		• Options for the substrate loading system. • Please select the-board feed type (push <standard> / pull-in).	
	◉ Substrate pusher with the overload sensor (M)		[M Standard]	Substrates in the input magazines are pushed into the machine. The overload sensor is incorporated to protect substrate when jammed.
	○ Substrate pusher with the overload sensor for the magazine changer (M)		This is for machine with the magazine changer. (Design of cover is different.) • Basic specification is same as the above.	
	○ Substrate pull-in unit (M)		Substrates in the input magazines are pulled in with the machine's arm. There must be more than 9mm clearance below the magazine's first slot. If the parts are there to-back surface of the substrate, please inform us.	
	○ Substrate pull-in unit for the magazine changer (M)		This is for machine with the magazine changer. (Design of cover is different.) • Basic specification is same as the above.	
	○ No substrate loading system (M)		Any substrate loading system is not equipped.	
	Additional options for thin substrate (M type)		Option for handling thin substrate	
	☑ Substrate transporting claw with the overload sensor (M)		Substrates are protected from damage by the overload sensor when jammed. Cycle time may become longer due to slower ttransport speed for protection.	
	☑ Guide for substrate transfer (M)		A mechanical guide to assist transportation of substrate warping downward. This is an option for the substrate pusher system with overload sensor, and not available for the option substrate puller system.	
	☐ Cover to align substarte of upward warping (M)		A cover for the upward warping substrate. This option assists transportation to the chamber or output magazines.	
	Loader & Unloader (M type)		Please select the form of loader & unloader (single or magazine changer or none).	
	○ Loader & Unloader single (M)		[M Standard]	• No magazine changer. • Including the magazine holder and wiring. • The safety cover is simple type and not full-cover.
	◉ Loader & Unloader with magazine changer (M)		• Loader & Unloader with the magazine changer • Including the magazine holder and wiring. * Magazine height must be lower than 175 ㎜.	
	○ No loader and no unloader (M)		• When substrate is manual load only or the machine is hooked up with the system of other supplier.	
11	Other options (M type options)		• Vacuum pump x 1pc is included in [Standard specification]. The spare vacuum pump is for during overhaul period.	
	Additional options (M type)			
	☑ Plasma monitor (M)		State of the plasma discharge can be monitored.	

3.6 Manual

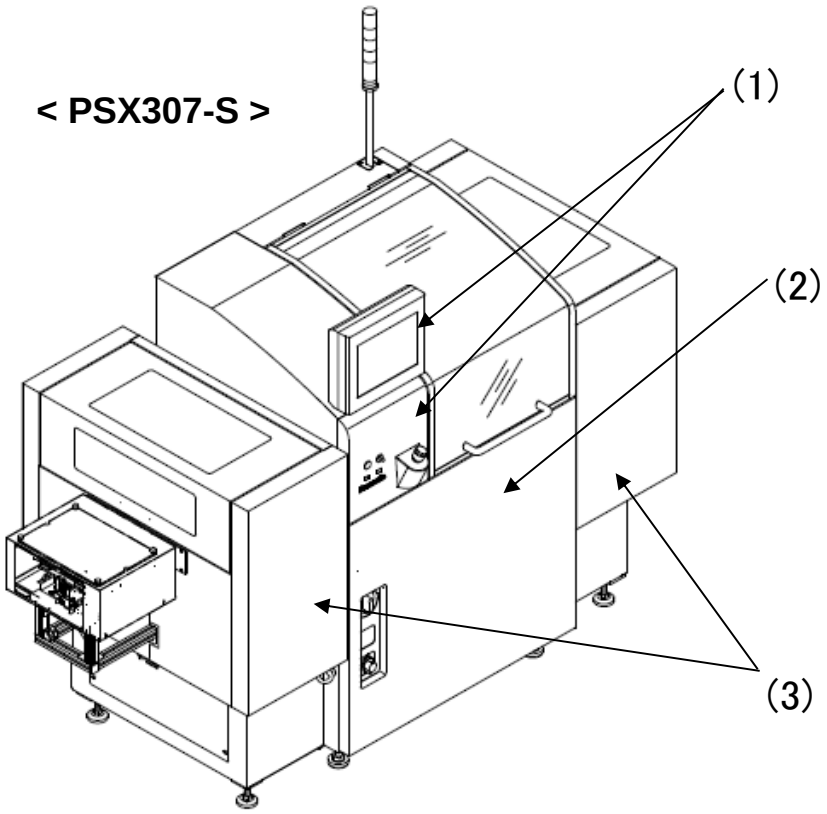
	Option name	Qty	Specifications
13	Manual		• Standard Specification is normal paper and written in Japanese • Standard Specification is DVD-ROM and written in Japanese
	Paper		
	☐ Standard Manual (Japanese):normal paper		[Standard specification] • Standard Manual(Japanese)normal paper×1set
	☐ Standard Manual (Japanese):clean paper		• Standard Manual(Japanese)clean paper
	☐ Standard Manual (English):normal paper		• Standard Manual(English)normal paper
	☑ Standard Manual (English):clean paper	1	• Standard Manual(English)clean paper
	☐ Standard Manual (Chinese):normal paper		• Standard Manual（Chinese）normal paper
	☐ Standard Manual (Chinese):clean paper		• Standard Manual（Chinese）clean paper
	DVD-ROM		
	☐ Standard Manual (Japanese):DVD-ROM		[Standard specification] • Standard Manual(Japanese)DVD-ROM×1piece
	☑ Standard Manual (English):DVD-ROM	1	• Standard Manual(English)DVD-ROM × 1piece
	☐ Standard Manual (Chinese):DVD-ROM		• Standard Manual（Chinese）DVD-ROM × 1piece

4. Component for Customer work

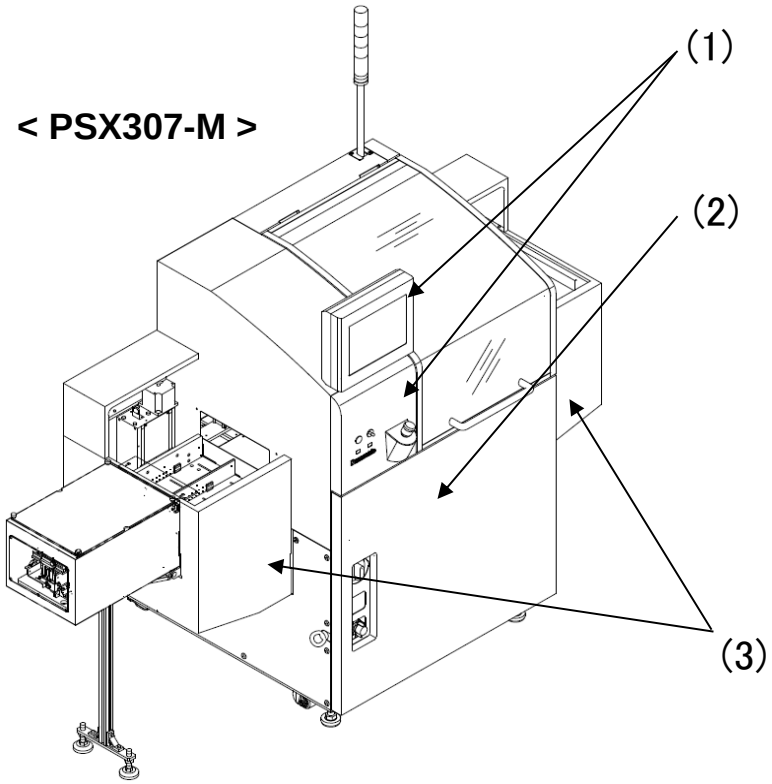
Project No.

		Item (Applicable range)	Product A	Product B	Product C
1	PCB Specification	PCB material	○ Polyimide ○ BT resin board ○ Glass epoxy board ○ Film board ○ Ceramic board ● Other Carrier	○ Polyimide ○ BT resin board ○ Glass epoxy board ○ Film board ○ Ceramic board ○ Other	○ Polyimide ○ BT resin board ○ Glass epoxy board ○ Film board ○ Ceramic board ○ Other
		Etched material	○ Gold: electrolytic plating ○ Gold: flash plating ○ Sliver • Other	○ Gold: electrolytic plating ○ Gold: flash plating ○ Sliver • Other	○ Gold: electrolytic plating ○ Gold: flash plating ○ Sliver • Other
		Object	○ Improvement of bond reliability ○ Mold resin adhesion ● Underfill wettability ○ Other	○ Improvement of bond reliability ○ Mold resin adhesion ○ Underfill wettability ○ Other	○ Improvement of bond reliability ○ Mold resin adhesion ○ Underfill wettability ○ Other
		Any mount devices on the back side of PCB	○ No ○ Yes	○ No ○ Yes	○ No ○ Yes
		PCB dimensions X : 50mm to 250mm	310 mm	mm	mm
		PCB dimensions Y : 20mm to 70mm	160 mm	mm	mm
		PCB dimensions t : 0.5mm to 2.0mm	1.2 mm	mm	mm
		Warpage Less than ± 1.0mm	± mm	± mm	± mm
2	User Magazine	Magazine size	•W:30 mm to 80 mm (3 column), 30 mm to 125 mm (2 column) •L:100 mm to 260 mm (PSX307-S), 100 mm to 350 mm (PSX307-M Single lifter), 100 mm to 330 mm (PSX307-M Changer) (M type : W:25 mm to 125 mm, L:100 mm to 350 mm) • H: 75 mm to 175 mm (Changer), 75 mm to 240 mm (Single lifter) • First -slot offset: A= 15 mm or more, B= 9 mm or more		
		Customer's magazine (Fill in the blank when the magazine is provided by customer.)	Product A: W: mm, L: mm, H: mm, P: mm, T: mm, 1st-slot H: mm	Product B: W: mm, L: mm, H: mm, P: mm, T: mm, 1st-slot H: mm	Product C: W: mm, L: mm, H: mm, P: mm, T: mm, 1st-slot H: mm
			• The length of magazine should be 10 mm longer than that of a PCB. • Magazine design will be specific depending on the substrate width. • Panasonic magazine is available as option. ・Standard stopper may not be used according to the shape of bottom plate when magazine length is more than 247mm of type S or 318mm of type M. • Please let us know if your magazine has openings in its side wall. ・Please tell us the first-slot offset of your magazine (shown in the right). Some substrates may not be accessed if A = less than 15mm or B = less than 9mm. ・Available number of slot depends on the magazine design.		
3	Remarks		• PCB should be flat, with no parts mounted on bottom side. In some cases, no remedial action can be taken if warpage exceeds the prescribed value even when the PCB size satisfies the above dimensions. Please provide us with all the relevant information in advance. • In cases where the above warpage is exceeded, the skipped-level magazine specifications and pressure control process specifications for the plasma treatment are required. It may not be possible to take any remedial action in some cases. • With film PCBs, we recommend using a carrier, plated with ceramic (with min. thickness of 20 µm). If you can not plate on the carrier, control the clearance between the PCB and the carrier to less than 2 mm. Otherwise, the board may be damaged by spark. • The back side of PCBs must be flat without any surface mount devices. If there are surface mount devices on the back side, you have to prepare the specific electrode and need to verify the quality. ・When a workpiece contains any magnetic material, non-uniform discharge will occur. Prior assessments is required.		

< PSX307-S >



< PSX307-M >



No.	
1	Touch panel operating area: Stainless hairline finishing
2	Main body: Stainless hairline finishing
3	Loader/unloader: Stainless hairline finishing

• There are partly welding marks on the surface of standard stainless cover. (No welding marks finishing can be selected from option.)

6. Customer-requested specification

Project No.	

If there are any mutual arrangements that are not written in this specifications, or special matters for buy-off check items (2 or more work types or acceptance inspection items), please note in below.

Customer's requests		
No.	Items	Descriptions
1	Add specification	Transport claw (2 claws type)
2	Add specification	Parts for the ionizer. (Ionizer ;DJK Supply)
3	Add specification	Electric outlet (100V)
4	Carrier specification	1 lane typr (Carrier W160㎜×L310㎜)

(Note) Specify the quantity of parts,if any.

7. Buy-off check items

Project No.	

7.1 Criteria for acceptance quality

	Item	Content
1	Ultimate Vacuum	• Measure pressure for 2 min after pump-down from normal, with no boards present. Pressure should be max. 3 Pa,.
2	Cycle Time	• PSX307-S:Within 30 s (It is assumed that the processing time is set to 8 s for argon as the discharge gas and 5 s for oxygen.) (45 seconds or less for board length 120 mm or less) • PSX307-M:Within 45 s (It is assumed that the processing time is set to 13 s for argon as th discharge gas and 10 s for oxygen.) (60 seconds or less for board length 160 mm or less)
3	Remarks	• Processing time, and exhaust to discharge preparation time depend on conditions of the PCBs etched. (PCB size, materials). Confirm the cycle time with your own PCB. • The above cycle time is measured with argon gas without any substrates inside the chamber. • Since there are any substrate, substrate handling is simulation (250 mm length) is specified in program) In the case of oxygen gas, treatment time setting is 5 seconds and gas flow setting is 50ml/mim. other conditions are same as argon. • In principle, deterioration of electronic component characteristics due to charged particles emitted during plasma etching outside the warranty. Please test to check whether your work can be processed and confirm the etching conditions. • During etching, reverse contamination may be caused by the surface materials of the products being etched. Conduct a test beforehand to judge whether the work can be processed. Reverse contamination by metals other than gold and aluminum are outside the machine's warranty. • The samples given on the left and used for measurement may be replaced with equivalent items if so warranted by conditions on the market. • Use of gases other than those specified in the specifications is outside the warranty on the machine.

7.3 PSX307-S Criteria for acceptance quality

1 Inorganic matter Etching Speed (PSX307-S)

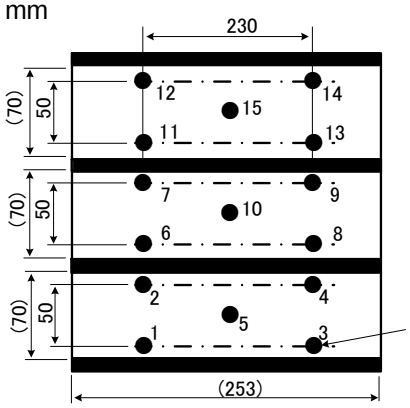
Inspection method	
RF power	600 W
Etching time	5 minutes × 2
Target material	Gold (plating)
Measurement method (Film pressure measurement)	X-ray fluorescence film thickness gauge
Gas	Ar

Gas flow rate setting: 5 ml /min

- Etching speed for all measured points more than 26 nm/min
- Distribution (variation) within ±30 %

$$\text{Distribution variation} = \frac{(\text{Max} - \text{Min})}{(\text{Max} + \text{Min})}$$

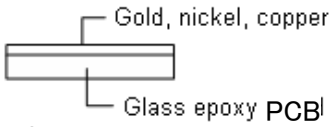
unit: mm



Set the sample on the points and measure.

Operator side

	Etching speed		Result
	Standard value	Inspected value	Judge
1	All measured points more than 26nm /min	nm /min	
2		nm /min	
3		nm /min	
4		nm /min	
5		nm /min	
6		nm /min	
7		nm /min	
8		nm /min	
9		nm /min	
10		nm /min	
11		nm /min	
12		nm /min	
13		nm /min	
14		nm /min	
15		nm /min	



2 Organic Matter Etching Speed (PSX307-S) (Only for O_2 gas is selected: Option)

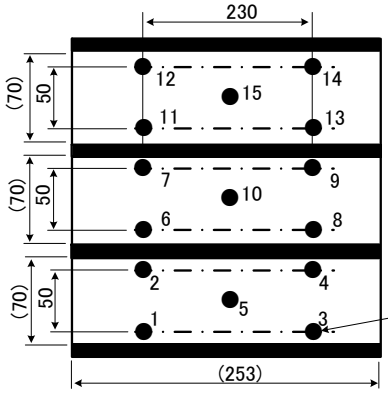
Inspection method	
RF power	600 W
Etching time	30 s
Target material	Positive resist
Measurement method (Film pressure measurement)	Optical interferometric film thickness gauge
Gas	O_2

Gas flow rate setting: 50 ml /min

- Etching speed for all measured points more than 800 nm/min
- Distribution (variation) within ±30 %

$$\text{Distribution variation} = \frac{(\text{Max} - \text{Min})}{(\text{Max} + \text{Min})}$$

unit: mm



Set the sample on the points and measure.

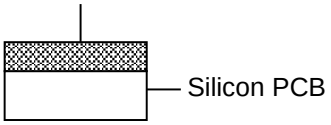
Operator side

	Etching speed		Result
	Standard value	Inspected value	Judge
1	Average for all measured points more than 800 nm /min	nm /min	
2		nm /min	
3		nm /min	
4		nm /min	
5		nm /min	
6		nm /min	
7		nm /min	
8		nm /min	
9		nm /min	
10		nm /min	
11		nm /min	
12		nm /min	
13		nm /min	
14		nm /min	
15		nm /min	
Average		nm /min	

Sample: 6 mm x 6 mm Silicon piece

Positive resist

PMER P-LA900PM



7.4 PSX307-M Criteria for acceptance quality

3 Inorganic Matter Etching Speed (PSX307-M)

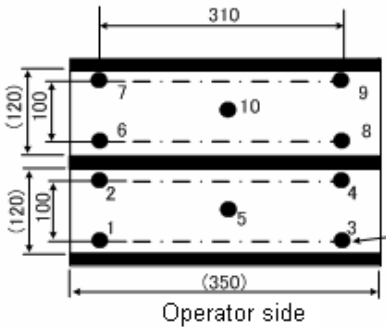
Inspection method	
RF power	600 W
Etching time	5 minutes × 2
Target material	Gold (plating)
Measurement method (Film pressure measurement)	X-ray fluorescence film thickness gauge
Gas	Ar

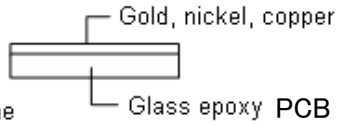
Gas flow rate setting: 5 ml /min

- Etching speed for all measured points more than 18 nm/min
- Distribution (variation) within ±30 %

$$\text{Distribution variation} = \frac{(\text{Max} - \text{Min})}{(\text{Max} + \text{Min})}$$

unit: mm





Etching speed			Result
Standard value		Inspected value	Judge
1	All measured points more than 180 nm /min	nm /min	
2		nm /min	
3		nm /min	
4		nm /min	
5		nm /min	
6		nm /min	
7		nm /min	
8		nm /min	
9		nm /min	
10		nm /min	
11		nm /min	
12		nm /min	
13		nm /min	
14		nm /min	
15		nm /min	

4 Organic Matter Etching Speed (PSX307-M) (Only for O_2 gas is selected: Option)

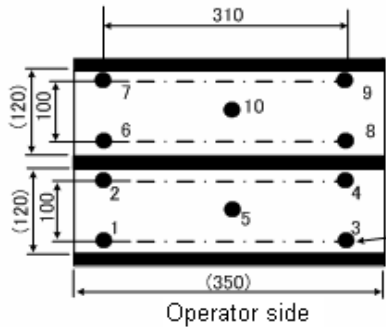
Inspection method	
RF power	600 W
Etching time	30 s
Target material	Positive resist
Measurement method (Film pressure measurement)	Optical interferometric film thickness gauge
Gas	O_2

Gas flow rate setting: 50 ml /min

- Etching speed for all measured points more than 420 nm/min
- Distribution (variation) within ±30 %

$$\text{Distribution variation} = \frac{(\text{Max} - \text{Min})}{(\text{Max} + \text{Min})}$$

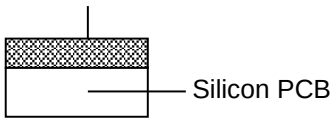
unit: mm



Sample: 6 mm x 6 mm Silicon piece

Positive resist

PMER P-LA900PM



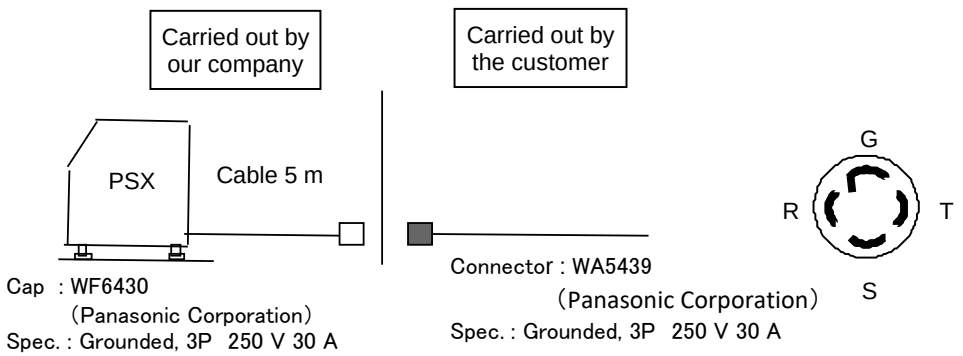
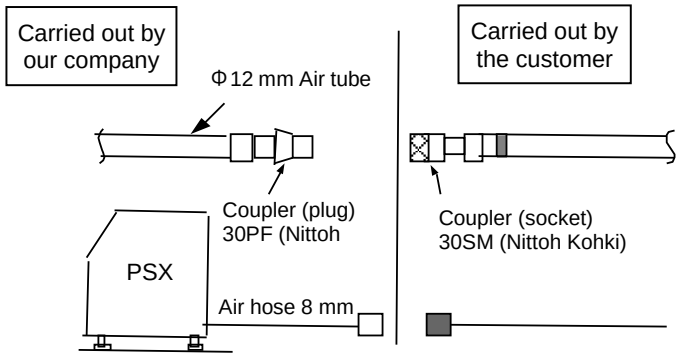
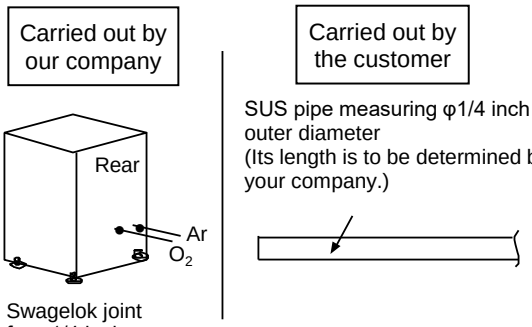
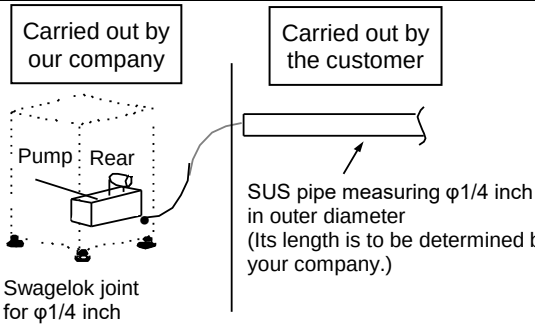
Etching speed			Result
Standard value		Inspected value	Judge
1	Average for all measured points more than 420 nm /min	nm /min	
2		nm /min	
3		nm /min	
4		nm /min	
5		nm /min	
6		nm /min	
7		nm /min	
8		nm /min	
9		nm /min	
10		nm /min	
11		nm /min	
12		nm /min	
13		nm /min	
14		nm /min	
15		nm /min	
Average		nm /min	

8. Shipment and delivery condition

Project No.	

1	Buy-off Check	• Buy-off check is performed based on Panasonic standard. • Refer to the buy-off check items list for check items. Also, some items such as continuous operation check, are possible to select works to be used. Please select below. • For two or more work types, additional expense is required. Please describe any special note in buy-off check items or two or more work types.			
2	Buy-off Check Work Before Shipment	○	Panasonic evaluation PCB		
		○	Customer supplied product (One type only)	Type	
3	Buy-off Check Work At Delivery	○	Panasonic evaluation PCB		
		○	Customer supplied product (One type only)	Type	

9.2 Electric Source Unit ・Pneumatic Source Unit

1	Electric Source Unit	 Cap : WF6430 (Panasonic Corporation) Spec. : Grounded, 3P 250 V 30 A Connector : WA5439 (Panasonic Corporation) Spec. : Grounded, 3P 250 V 30 A
2	Pneumatic Source Unit	
3	Ar/O2 gas supply unit (O2 gas is optional.PSX303-S/M)	 Ar purity: 99.999% or more (10 L or 50 L container) O2 purity: 99.99% or more (10 L or 50 L container) 12 MPa to 15 MPa filled (Shall be fixed by the gas cylinder stand etc.) Manifold-type pressure-reducing valve with stop valve Primary: 0 MPa to 25 MPa, Secondary: -0.1 MPa to 0.3 MPa • NISSAN TANAKA CORPORATION S2-1VR-1G8C-B1N4-00. An ss-400-6 swagelok coupling is required for connecting a 1/4" diameter pipe with the above regulator.
4	N2 Gas supply unit (option) When the O2 gas is selected, it is necessary.	 N2 purity: 99.99% or more, 50 L container 12 MPa to 15 MPa filled (Shall be fixed by the gas cylinder stand etc.) Manifold-type pressure-reducing valve with stop valve Primary: 0 MPa to 25 MPa, Secondary: 0 MPa to 0.3 Mpa * For PSX307-MR, support for O2/N2 gas is included in the standard specifications.
5	Exhaust Duct