

# 晶圓廠 TEL LPCVD-POLY 爐管PM保養程序

## Maintenance Procedure for the PM of TEL LPCVD-POLY at Wafer FAB

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## 晶圓廠 TEL LPCVD-POLY 爐管PM保養程序

# Wafer FAB TEL LPCVD-POLY Furnace PM Maintenance Procedure

壹、目的：

### 1. Objective:

使機台維持最佳狀況、降低 DOWN TIME。

To maintain the best condition of the machine, reduce the DOWN TIME

貳、適用時機：

### 2. Suitable time:

一、大PM： $19 \pm 2 \mu\text{m}$ (normal poly for P1,P2,P3,P4,P6)。

小PM： $9 \pm 2 \mu\text{m}$ (normal poly for P1,P2,P3,P4,P6)。

大PM： $40 \pm 10$  run(In-situ 製程 for P7)。

Major PM:  $19 \pm 2 \mu\text{m}$ (normal poly for P1,P2,P3,P4,P6)。

Minor PM:  $9 \pm 2 \mu\text{m}$ (normal poly for P1,P2,P3,P4,P6).

Major PM:  $40 \pm 10$  run(In-situ Process for P7)。

二、機臺異常須 PM 時。

Machine abnormal must PM

三、更換製程須 PM 時。

Change process need to PM

四、年度歲修須 PM 時。

Annual shut down to be PM

\*\* 遇特殊情況時，在機臺狀況允許下，可適度將 PM 時機“ $\pm$ 值”放寬至三倍以內作 PM。

\*\*In special circumstances, under the machine conditions permit, it is appropriate to

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PM “±value” relaxed to less than 3 times for PM

參、 執行規則：

### 3. Rule execution:

大PM(1PM)→小PM→大PM(2PM)→小PM→大PM(3PM)→小PM→大PM(4PM)→小PM→大PM(5PM)。

Major PM (1PM) →minor PM→major PM(2PM)→minor PM→major PM(3PM)→minor PM→major PM(4PM)→minor PM→major PM(5PM)。

肆、 使用材料：

### 4. Material to use:

IPA (異丙醇) , 無塵布 , O-RING .....等。

IPA, wiper, O-ring, etc.

伍、 使用設備：

### 5. Use facilities:

公制六角扳手，活動扳手，十字一字起子，TUBE SLIDER...等。

Metric hex wrenches, wrenches, cross screwdriver, TUBE SLIDER...etc.

陸、 安全事項：

### 6. Safety matters:

一、石英配件易碎，拆裝請小心，並請於拆裝石英過程，全程配戴棉手套 & 護目鏡，避免遭石英割傷 & 造成眼部傷害。

1. Quartz accessories are fragile, please be careful when disassembling and assembling, and please wear cotton gloves & goggles during the process of disassembling and assembling the quartz to avoid being cut by the quartz and causing eye damage.

二、MANIFOLD 及外管重量不輕,請注意拆裝之安全。

2. MANIFOLD and the outer tube weight is not light, please pay attention to safety during

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disassembly

三、待內外管溫度低於 150°C (面板顯示) 時，才可執行拆管，並於拿取內外管時，請全程配戴隔熱手套，以避免灼傷。

3. When the temperature of the inner and outer tubes is lower than 150°C (displayed on the panel), the tube can be dismantled. When handling the inner and outer tubes, please wear heat-resistant gloves to avoid burns.

四、請使用手推車搬運內外管於酸房與機臺之間，並將內外管放置於台車上時，請配戴隔熱手套，以避免灼傷。

4. Please use a trolley to carry the inner and outer pipes between the acid room and the machine, and when placing the inner and outer pipes on the platform, please wear heat-resistant gloves to avoid burns.

五、使用化學品,應穿戴防護器具。

5. Use chemicals, wear protective equipment

六、PM 拆下之零件並分解，再拿至震盪槽 CLEAN，震完後管內以 DI 沖洗再以 AIR 吹乾  
以上動作有水漬噴濺，必須穿戴護目鏡或防護器具，避免造成眼部傷害。

6. PM remove the parts and disassemble them, then take them to the shock tank CLEAN. After the earthquake, rinse the tubes with DI and then dry them with AIR.

The above actions are splashed with water and must be worn with goggles or protective gear to avoid eye damage.

七、於PM 時使用 low vacuum clean 零件，必須配戴耳罩避免耳部噪音之傷害。

7. Use low vacuum clean parts for PM and wear earmuffs to avoid ear noise.

八、拆裝管 & 調整承接時請使用護墊保護膝蓋。

8. Use pads to protect knees when removing tubes & adjusting sockets.

九、烤箱溫度高於 50°C 時，拿取 Parts 請全程配戴隔熱手套，以避免灼傷。

9. When the oven temperature is higher than 50°C, please wear heat-resistant gloves when handling Parts to avoid burns.

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柒、操作步驟：

## 7. Steps:

### ● 小 PM保養程序：

#### Minor PM maintenance procedure:

更換 SIC BOAT,調整 BOAT 與 PEDESTAL COVER 承接時晃動的程度至最小後調整BOAT及BOAT LOCK的位置。

Replace SIC BOAT, adjust the BOAT and PEDESTAL COVER to undertake when the degree of shaking to a minimum after the adjustment BOAT and BOAT LOCK location.

(參考技G3363-1010)

(Reference technology Information, G3363-1010)

T-BAWL 傳送 CHECK(參考技資G3363-1010) , 只需 CHECK FORK-5即可。

T-BAWL sends CHECK (Refer to technology information G3363-1010), only CHECK FORK-5 復機同項目二十執行 , 小PM 保養工作至此完成。

With the implementation of the machine recovery the same item 20, minor PM maintenance work to this complete.

### ● 大PM保養程序

#### Major PM maintenance procedure

一、降溫：將208V POWER OFF。

1. Cooling: 208V POWER OFF.

二、將 BOAT 上的 DUMMY WAFER 以 T-BAWL 取下(RUN MODE 下之DUMMY UNLOAD)。

2. Remove the DUMMY WAFER from BOAT with T-BAWL (DUMMY UNLOAD in RUN MODE).

三、將PEDESTAL COVER、PEDESTAL 5-fin取下，用六角扳手將PEDESTAL TABLE 的螺絲鬆開取下 DUST TRAY、T/C PORT、COVER後一同拿至洗管間供酸房人員清洗。

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3. Remove the PEDESTAL COVER, PEDESTAL 5-fin, with hexagonal wrench to PEDESTAL TABLE to screw to remove the DUST TRAY, T/C PORT, COVER together after the wash room for the wash room for the staff to clean.

四、使用 VL-800 MANU MODE 下之MAUNAL 或 ADJUST 的 MOTION 5 將 BOAT CLAMP 鬆開後將 BOAT拿至洗管間供酸房人員清洗。

4. Use the VL800 MANUAL MODE under the MANUAL or ADJUST MOTION 5 BOAT CLAMP will be released after the BOAT to get to wash room for the acid cleaning room staff.

五、當爐管溫度降至150°C以下時可進行拆管,其步驟如下: (為促進降溫速度，可將 DOOR SHUTTER 打開。其方法為 MANUAL 或 ADJUST 的 MOTION 3至P02->MOTION 4 至P02 )

5. When the temperature of the furnace tube drops below 150°C, the tube can be dismantled, and the steps are as follows: (In order to accelerate the cooling speed, the DOOR SHUTTER can be opened. The method is MOTION 3 to P02->MOTION 4 to P02 of MANUAL or ADJUST)

(1). 以 " + " 字起子將遮蓋 MANIFOLD 的 PANEL 取下。

(1). Removed by " + " screwdriver to cover MANIFOLD PANEL.

(2). 以六角扳手鬆開 DOOR SHUTTER 的螺絲後取下 DOOR SHUTTER。

\*\* VL-800 之MOTION 3 及 MOTION 4 均須在 POSITION 2，MOTION 1 不可超過POSITION 2。

\*\* 鬆開螺絲時須用另一隻手扶著 DOOR SHUTTER 防止其掉下。

(2). Loosen the DOOR SHUTTER screw with a hexagonal wrench and remove the DOOR SHUTTER.

\*\* For MOTION 3 and MOTION 4 of VL-800, POSITION 2 and MOTION 1 must not exceed POSITION

\*\* When loosening the screws, use the other hand to hold the DOOR SHUTTER to prevent it from falling.

(3). 拆 SiH4 1、SiH4 2 INJECTOR。

(3). Remove SiH4 1, SiH4 2 INJECTOR.

(4). 拆 PSI 接頭、VACUUM PIPE。

(4). Remove the PSI connector, VACUUM PIPE

(5). 拆內管，步驟如下(所提即的各部位名稱請參考圖二)：

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(5). Remove the inner tube, the steps are as follows (refer to the name of the various parts of Figure 2):

\*\* 將MANIFOLD INSTALLATION JIG 放在CAPPING FLANGE上。

將INNER JIG 放在MANIFOLD INSTALLATION JIG 上，其POSITIONING BLOCK 須對準MANIFOLD INSTALLATION JIG 上的LOCATION GROOVE。

將ROTARY HANDLE 轉至 " LOCK " 位置。

檢查 VL-800 MOTION 1 (SET □ M01 □ SPD )之速度是否為100，如果不是請改成100。

將 VL-800 MOTION 1 往上升，注意與MANIFOLD INSTALLATION JIG 交接是否平穩，如不平穩請調整之，如果平穩則繼續上升。當MANIFOLD INSTALLATION JIG 接近 MANIFOLD 時請注意 INNER JIG 上的POSITIONING BLOCK 須對準MANIFOLD 上的POSITIONING BLOCK，當B/E上的彈簧稍微壓縮時即停止上升。

將ROTARY HANDLE 轉至" FREE " 位置。

將 VL-800 MOTION 1往下降，速度宜緩慢，可自VACUUM PIPE HOLE 中觀查內管下降情形，當B/E降至接近TUBE SLIDER 時請小心，勿使內管晃動。

B/E 續降至POSITION 1後取下內管、INNER TUBE HOLDER、INNER JIG。

Put the MANIFOLD INSTALLATION JIG on the CAPPING FLANGE.

Put the INNER JIG on the MANIFOLD INSTALLATION JIG, the POSITIONING BLOCK MUST aim LOCATION GROOVE on the MANIFOLD INSTALLATION JIG

Transfer the ROTARY HANDLE to "LOCK" location

Check VL-800 MOTION 1 (SET MO1 SPD) speed if 100, if not change to 100.

Move the VL-800 MOTION 1 up and note if the handover to the MANIFOLD INSTALLATION JIG is stable, the whole, if the continues to rise steadily. Note the INNER JIG when MANIFOLD INSTALLATION JIG is close to MANIFOLD INSTALLATION JIG is close to MANIFOLD, on the POSITIONING BLOCK must be aligned MANIFOLD on the POSITIONING BLOCK, when the spring on the B/E is slightly compressed stop rising. Move the ROTARY HANDLE to the FREE position. The VL-800 MOTION 1 to decline, the speed should be slow. Can be observed from the VACUUM PIPE



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HOLE tube when the B/E decline. Be careful when approaching the TUBE SLIDER. Do not rock the inner tube. B/E continued down to POSITION 1 after the removal of the inner tube, INNER TUBE HOLDER, INNER JIG.

(6). 拆N2 INJECTOR。

(6). Remove N2 INJECTOR

(7). 拆PADDLE T/C(無則將INJECTOR CAP拆下)。

(7). Remove PADDLE T/C (if not, remove the INJECTOR CAP)

(8). 拆外管，步驟如下(所提及的各部位名稱，請參考圖三)：

(8). Remove outer tube, the following steps (the names of the parts mentioned, please refer to Figure 3)

\*\* 將B/E 往上升，與MANIFOLD INSTALLATION JIG 交接時須注意是否平穩，如不平穩 請調整之；如果平穩，則可繼續上升。接近MANIFOLD 時須注意LOCATION GROOVE 要對準MANIFOLD 的 POSITIONING BLOCK，當B/E 的彈簧稍微壓縮時即停止上升。

將MANIFOLD CHILLING WATER BELLOW 快速接頭與機台分離並纏繞於B/E旁，然後鬆開4顆固定 MANIFOLD 的螺絲 (LOCK HANDLE)。

將B/E 往下降，須注意MANIFOLD 是否一同下降，降至POSITION 3 附近時須提防勿使MANIFOLD 碰到BOAT TRANSFER，在與TUBE SLIDER 交接時亦不要引起 太大晃動，當B/E 降至POSITION 1即停住。

鬆開固定外管的BOLT 上的螺絲後取下BOLT，TEFLON RING。

取下外管、O-RING、O-RING HOLDER、MANIFOLD。

Rise the B/E and MANIFOLD INSTALLATION JIG handover should pay attention to whether smooth, if not smooth, please adjust; If smooth, you can continue to rise. When approaching MANIFOLD, be aware that LOCATION GROOVE is aimed at the POSITIONING of MANIFOLD BLOCK, when the spring B/E is slightly compressed to stop rising. Separate the MANIFOLD CHILLING WATER BELLOW connector from the machine and wrap it around the B/E, then loosen the four MANIFOLD screws (LOCK HANDLE). Thee B/E to decline, we must pay attention to

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MANIFOLD whether together with the decline, down to the vicinity of POSITION 3 to be careful not to make MANIFOLD touch. Hit the BOAT TRANAFER, in connection with the TUBE SLIDER do not cause too much shaking when B/E down to POSITION 1 stop live. Loosen the screws on the BOLT securing the outer tube and remove the BOLT. TEFLON RING. Remove the outer tube, O-RING, O-RING HOLDER, MANIFOLD,

\*\* 拆下的石英配件須拿至洗管間由酸房人員負責清洗並準備一套以進行裝管。

\*\*The removed quartz must be taken to the wash room by the acid room staff responsible for cleaning and prepare a set to serve for the tube.

六、換下之 MANIFOLD 需至超音波震盪槽清潔，請至少震盪四小時，並於震盪結束後用菜瓜布+IPA刷洗至光亮，VACCUM PIPING 則以 IPA 清潔乾淨。

6. The replaced MANIFOLD needs to be cleaned in the ultrasonic vibration tank. Please shake it for at least four hours, and after the shaking is over, use a vegetable melon cloth + IPA to brush it until it is bright, and the VACCUM PIPING is cleaned with IPA.



**manifold**

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七、如遇5PM時則進行以下步驟否則跳過：

7. In the case of 5PM proceed to the following steps otherwise skip:

APC + MV 清潔及校正組裝程序。(附圖五)

APC + MV cleaning and calibrate install procedure.(Figure 5)

操作程序：

(1). 至樓將該機台PUMP 停機。

(1). Go to the floor and stop the PUMP of the machine.

(2). 將 MODEL 3200 切換成 MANUAL MODE。

(2). Change the MODEL 3200 to MANUAL MODE.

(3). 將APC CLOSE。

(3). CLOSE the APC.

(4). 將SV及其ELLOW拆下並將ELLOW送至震盪槽 CLEAN。

(4). Remove the SV and its ELLOW and send the ELLOW to the shock tank CLEAN

(5). 將VV1、VV2拆下並將其連接之ELLOW和與小砲管連接之ELLOW拆下送震盪槽 CLEAN。

(5). Remove VL1, VV2 and connect it to the ELLOW and small gun connected ELLOW and sent to the send shock tank CLEAN.

(6). 先將APC電源接頭拔除後將APC訊號連接頭拔下。使用兩隻活動板手將APC 螺絲鬆開後取下CLEAN。

(6). Unplug the APC connector after unplugging the APC power connector. Remove the APL screw with the 2 movable wrenches and remove the CLEAN.

(7). 將砲管拆下送至震盪槽 CLEAN。

(7). Remove the gun barrel to the shock tank CLEAN.

(8). 拆下MV並將上方6顆螺絲鬆開，取下上蓋後將MV BELLOW取出，用IPA清潔MV內部及BELLOW清潔乾淨後更換內部O-RING並組裝復歸。

(8). Remove the MV and release the top 6 screws, remove the cover after the MV BELLOW removed with IPA clean MV and BELLOW internal cleaning and replacement of internal O-RING and re-assembly.

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(9). 將氣管插入MV 氣管接頭後作通氣、洩氣動作，檢查MV是否正常上下作動。

(9). The trachea inserted into the MV tracheal connection for ventilation, deflated action, check the MV is up and down the normal action.

(10). 將COOL TRAP與MV間之小砲管拆下送至震盪槽 CLEAN。

(10). The COOL TRAP and MV between the small barrel removed to the shock tank clean

**(11).POLY 5PM 時需將 SiH4 GAS BELLOW\*2 拆至超音波震盪槽清潔，請至少震盪四小時，震完後需以 DI WATER 沖乾淨後再使用 AIR GUN 吹乾，並拿至烤箱烘烤，取出裝上機台前需再以 AIR GUN 吹淨 BELLOW 內部 (以無塵布按住 GAS BELLOW 一端出口，直到白布上無任何髒污為止)。**

**(11). For the POLY 5PM process, it is necessary to disassemble the SiH4 gas bellows\*2 for cleaning in an ultrasonic bath. Please ensure that they are sonicated for at least four hours. After sonication, rinse them thoroughly with DI water and use an air gun to dry them. Then, place them in an oven for baking. Before installing them back onto the machine, use an air gun to blow through the inside of the bellows, holding a clean cloth at one end of the gas bellow's outlet until no dirt is visible on the cloth.**

八、APC 清潔完成後執行APC開關角度測試(未拆除則否)。

8. APC cleaning after the completion of the implementation of APC switch angle test (if not removed, then APC will not be tested.)

(1). 先將APC訊號接頭接上後將APC電源接頭插上。

(1). Connect the APC connector to the APC power connector.

(2). 將APC open/close反覆數次，觀察APC是否有打滑現象、硬體角度(附圖FIG-5)、show出角度是否正確 (OPEN :  $500 \pm 10$  / CLOSE :  $25 \pm 5$ )

(2). The APC open/close repeated several times to observe whether the APC slip, the hardware angle (Figure FIG-5), show the angle is correct (OPEN :  $500 \pm 10$  / CLOSE :  $25 \pm 5$ )

(3). 打滑現象係指為GEAR動作但是葉片無動作，或MOTOR動作GEAR無動作：

將screw-2及screw-3共8顆screw鎖緊(附圖四)。

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(3). Slippage refers to the GEAR action but leaves no action or MOTOR action GEAR no action:

Screw-2 and screw-3 a total of 8 screw locking (Figure 4)

(4). APC CLOSE角度不對：

(4). APC CLOSE angle is wrong

(4-1). 將APC close，看葉片有無在1mm處。

(4-1). Will APC close, see whether the blade at 1mm

(4-2). 若無則將screw-2(4顆)鬆開，將葉片調整至1mm，再將screw-2鎖緊，再將APC OPEN再CLOSE。

(4-2). If not, then loosen screw-2 (4), adjust the blade to 1mm, then screw-2 lock, then APC OPEN CLOSE

(4-3). 此時APC SHOW 25，若不是則將SCREW-1鬆開轉動potentiometer，此時APC會SHOW出不同角度(數字)，將APC數字調整至 $25 \pm 5$ 內。(轉動 potentiometer 除了APC數字會變化外，葉片也會動作)，重覆上述動作將APC CLOSE調整至1mm處及APC SHOW25  $25 \pm 5$ 內。(附圖FIG-5)

(4-3). At this point APC SHOW 25, if not the SCREW-1 will rotate the potentiometer release, this time APC number adjusted within  $25 \pm 5$ . (Turn the potentiometer in addition to the APC number will change, the blade will move), repeat the above action will APC CLOSE adjusted to 1mm and APC SHOW within  $25 \pm 5$ . (attached pictogram FIG-5)

(5). APC OPEN角度不對：

(5). APC OPEN corner is not right:

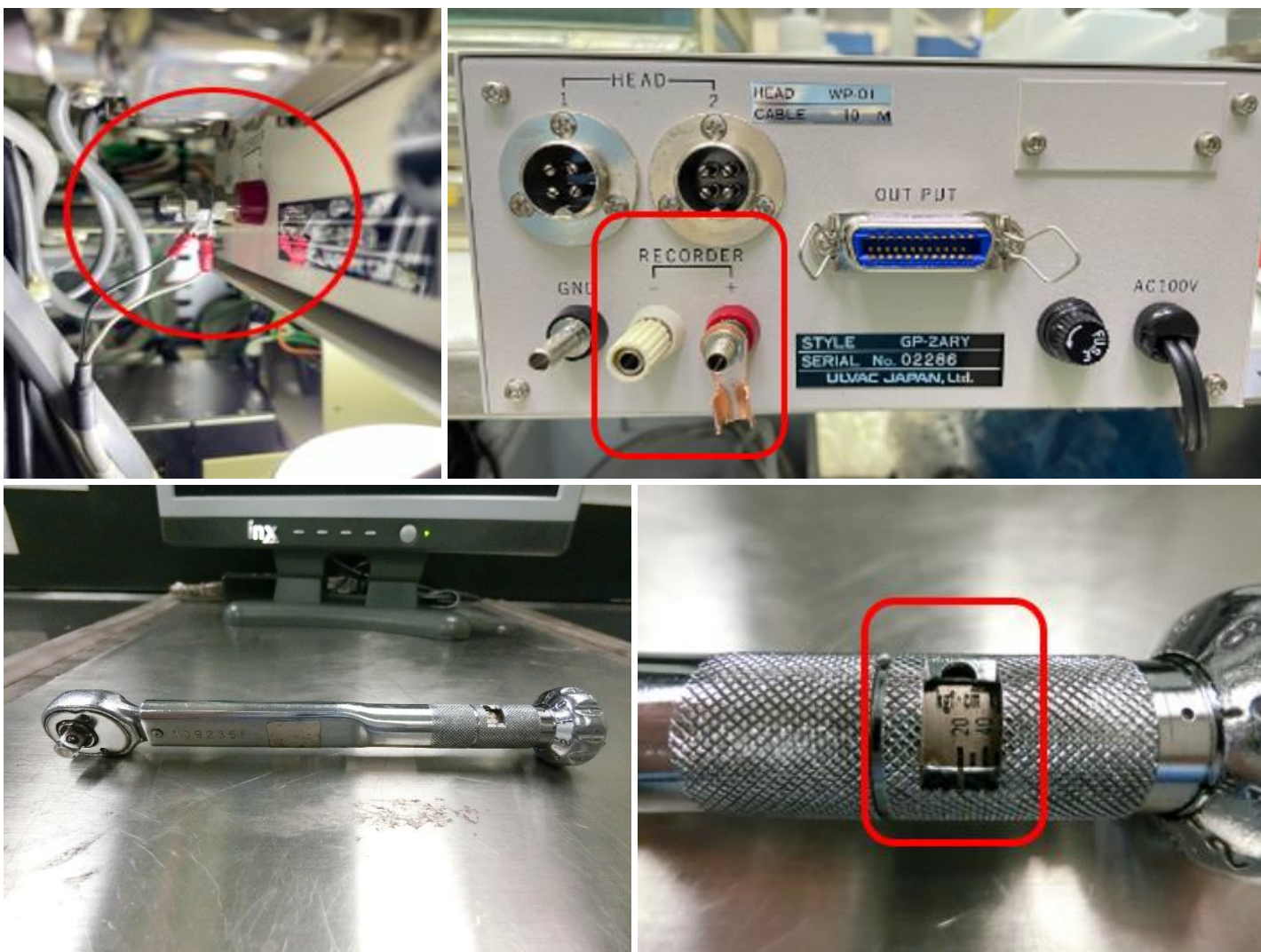
將APC OPEN看APC是否SHOW  $500 \pm 10$ ，不是則調整APC CONTROLLER的GAIN至正確位置(葉片不會動作)。(附圖四)

APC OPEN will see whether the APC SHOW  $500 \pm 10$ , not the APC CONTROLLER to adjust the GAIN to the correct location (leaves will not move).(Figure 4)

(6). 以扭力扳手 20kgf·cm 力道確認 Gauge controller recorder +/- 接點無鬆脫。

(6). Use a torque wrench of 20kgf.cm to confirm that the Gauge controller recorder +/- contacts are not loose.





九、組裝：

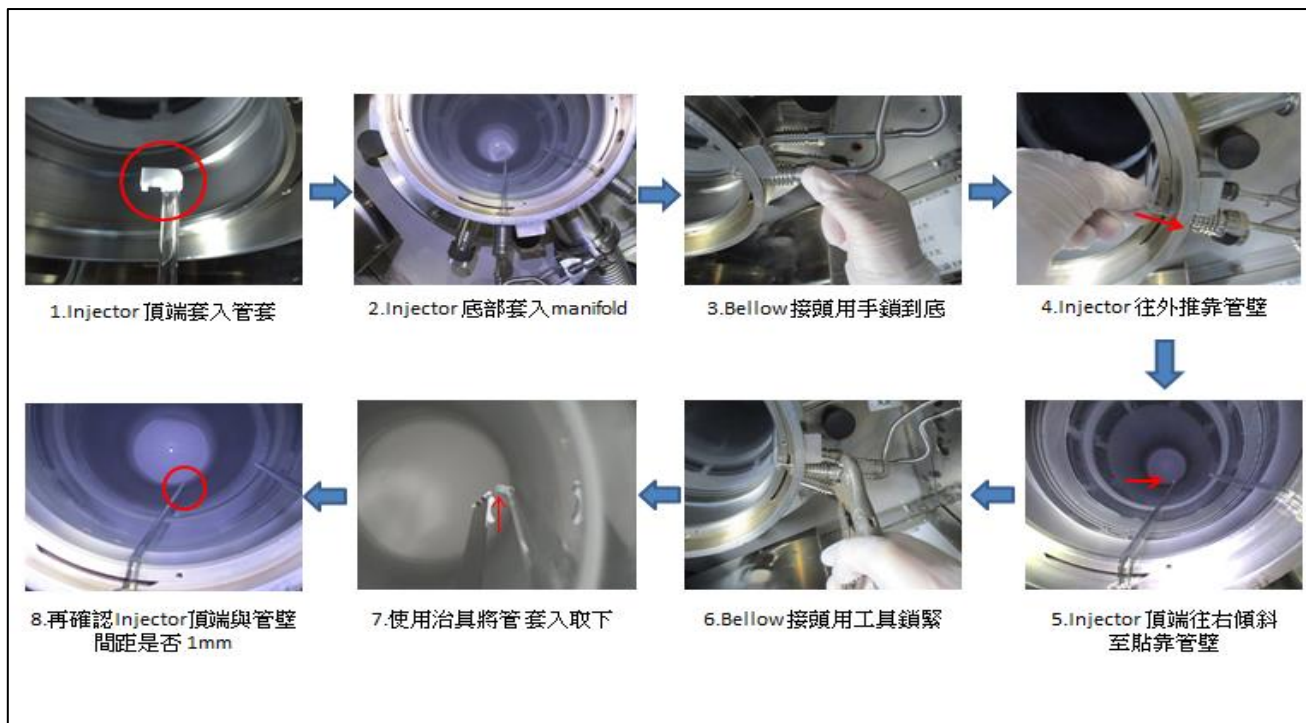
9. Assembly:

程序與拆管程序相反，不再贅述，亦請注意安全。

The procedure is the opposite of the demolition procedure.

injector 安裝手法：如圖解

Injector installation method: as illustrated



額外補充 injector 安裝技巧：

STEP1：先將 INJECTOR 插入 Tube 管口 & 套上 O-ring

STEP2：將 Gas bellow 接頭插入並將其鎖上幾牙(請水平地對準管口，不要歪斜插入又硬鎖牙，會造成 QUARTZ BREAK)

如何判斷是否水平?? 若鎖牙感到困難不順 => 請重調整 Angle 再次鎖入

STEP3：鎖上 2/3 後 -> 將 INJECTOR 往前推 -> 再鎖上幾牙 -> 直到用手轉不動後 -> 使用 Tool 鎖緊 (請使用雙手，一手請輕扶 INJECTOR，防止 INJECTOR 傾斜，一手鎖緊 Gas bellow)

訣竅：當快完全地鎖緊時，可以稍微將 INJECTOR 傾斜，再順勢鎖緊 => 便能夠使 INJECTOR 保持垂直狀態

Additional tips：

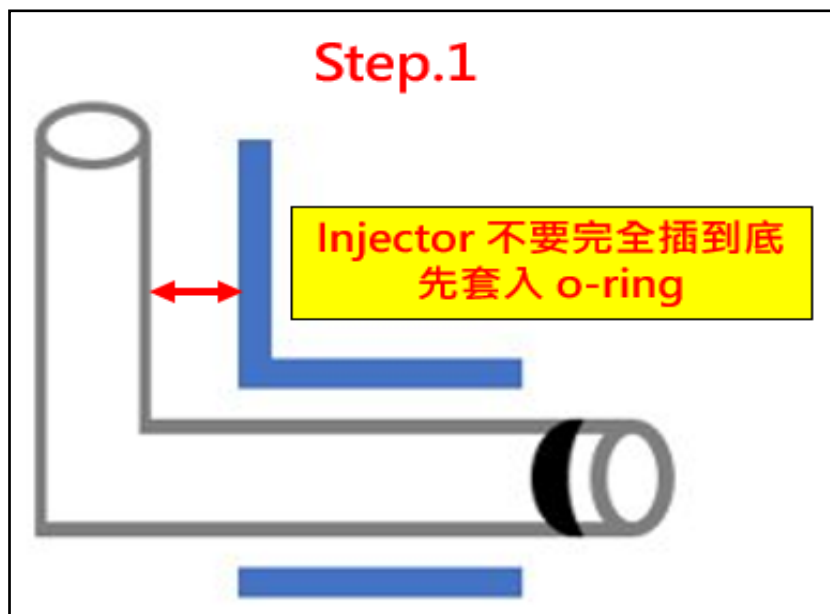
STEP1：First, Insert injector into the inside of the tube nozzle and place O-ring on it.

STEP2：insert gas bellow connector into the outside of the tube nozzle and tighten it a few turns(Remember, you need to tighten gas bellow connector a few turns in

horizontal. If you feel it's too difficult to tighten, adjust the direction of installation to horizontal, and then tighten it again to prevent the quartz from breaking.)

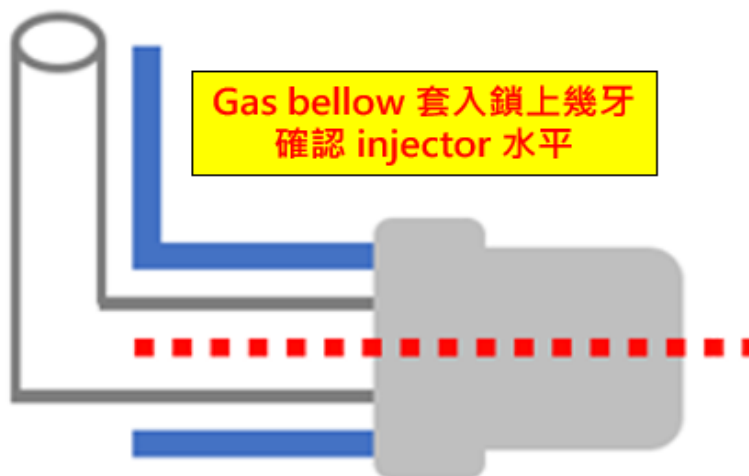
STEP3 : "After tightening a few turns → Push the injector forward → Tighten a few more turns → Until it can no longer be turned by hand → Use a tool to tighten (please use both hands: one hand gently support the injector to prevent it from tilting, while the other hand tightens the gas bellow connector).

Tip: When it's almost fully tightened, you can slightly tilt the injector, and then continue to tighten, which will help keep the injector in a vertical position."

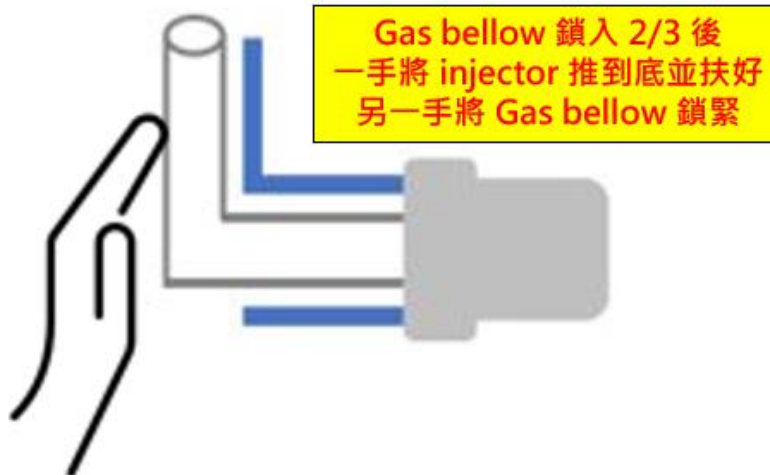




## Step.2



## Step.3

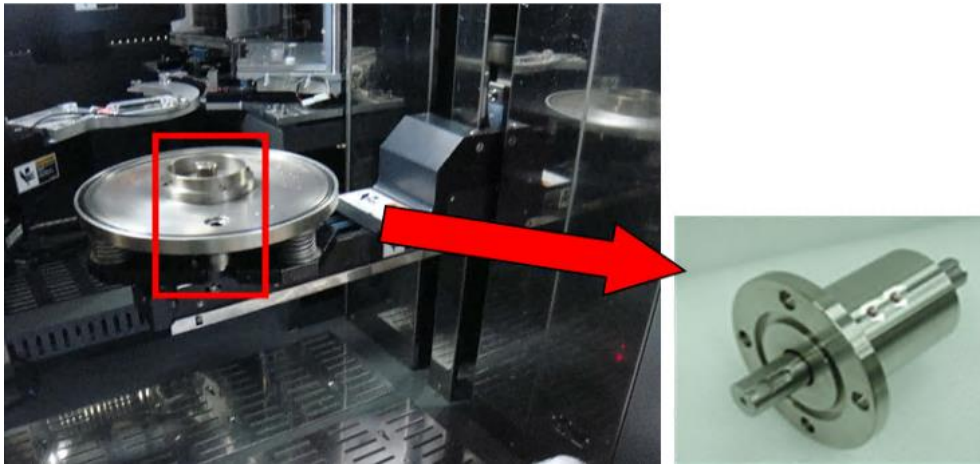


\*\* PUMP開啟前須先確認以LOCAL方式開啟。

\*\* Make sure to turn on the PUMP before starting.

\*\* 測試磁性流體(轉子)轉動時，是否有異音及抖動狀況，若有異常則更換之

\*\* When testing the rotation of a magnetic fluid (rotor), check for any abnormal noises or vibrations. If any abnormalities are found, replace it.



\*\* 裝PEDESTAL前須以水平儀檢查 CAPPING FLANGE 邊緣對角四點之水平狀態，若有偏差則須調整至最佳狀態。

\*\*Before the installation of PEDESTAL to be level to check CAPPING FLANGE four points on the edge of the horizontal state, if the deviation must be adjusted to the best condition

\*\* 裝完PEDESTAL COVER後，以水平儀檢查其與 BOAT 接合面之水平是否合乎要求，若有偏差則須調整至最佳狀態(參考技資G3363-1010)，手壓鐵板測試 elevator 下方 EMG-STOP switch 功能正常(VL-800 需有 ID.63 alarm)，再將 BOAT 置上保溫筒並伸入管內檢查是否會刮管，若有刮管之慮則須調整使之不刮管。

\*\* After installing the PEDESTAL, use a spirit level to check whether the level of the joint surface with the BOAT meets the requirements. If there is any deviation, adjust it to the best state (refer to technical material G3363-1010), and test the function of the EMG-STOP switch under the elevator by hand pressing the iron plate If it is normal (VL-800 needs ID.63 alarm), put the BOAT on the insulation tube and extend it into the tube to check whether it will scrape the tube.



\*\* PM 完CHECK及調整 B/E DRIVER VOLTAGE(SPEC RUN/STOP : 0.38+-0.04/0.18+-0.02V) , 若異常請更換新品。

\*\*PM complete CHECK and adjust B / E DRIVER VOLTAGE (SPEC RUN / STOP: 0.38 + -0.04 / 0.18 + -0.02V), if the exception please replace the new

\*\* PM 後拆下機臺正面COVER CLEAN CARRIER & STAGE ASSEMBLY & 機台內部周圍環境(COUNT/ORIENT/BODY..)。

\*\*After PM remove the COVER CLEAN CARRIER & STAGE ASSEMBLY & machine internal environment surroundings (COUNT/ORIENT/BODY..)

十、調整 BOAT 與PEDESTAL COVER 承接時晃動的程度至最小後調整BOAT及BOAT LOCK的位置。

10. Adjust the BOAT and PEDSTAL COVER to undertake when the degree of shaking to a minimum after the adjustment BOAT and BOAT LOCK position

(參考技G3363-1010)

(Refer to technology information, G3363-1010)

十一、測試氣聲：

11. TEST the sound of air:

(1). 將CAP連同PEDESTAL COVER升至P04位置。

(1). Increase the CAP to P04 with the PEDESTAL COVER

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- (2). 將 MODEL 3200 切換成 MANUAL MODE 。
  - (2). Change the MODEL 3200 to MANUAL MODE
  - (3). 關所有進 TUBE 的 GAS VALVE 。
  - (3). Close all TUBE of GAS VALVE.
  - (4).開 SV ， ATM燈熄滅後馬上關SV並通N2破大氣 。
  - (4). Open SV, ATM lights off immediately after the off SV and N2 break the atmosphere
  - (5). ATM燈亮起後將CAP緩緩下降 ， CHECK有管內壓力是否為大氣 。
  - (5). TM light will slowly drop CAP, CHECK whether the pressure inside the tube for the atmosphere
  - (6). 如果有氣往裡吸或是往外噴則調整760TORR SWITCH 。
  - (6). If there is gas inside or outside adjust the spray if 760TORR SWITCH
  - (7). 重複動作直至無氣聲為止
  - (7). Repeat until there is no sound
- 十二、低溫PURGE：
12. Low temperature PURGE:
- (1). 將CAP連同PEDESTAL升至 POSITION 4 。
  - (1). Increase the CAP with PEDESTAL to POSITION 4
  - (2). 將 MODEL 3200 切換成 MANUAL MODE 。
  - (2). Change the MODEL 3200 to MANUAL MODE.
  - (3). 關所有進 TUBE 的 GAS VALVE 。
  - (3). Shut all the GAS VALVE that will enter the TUBE.
  - (4). 開 SV 小抽 ， 待管內壓力低於 5 TORR 時再開 MV大抽 。
  - (4). Open SV small pumping, to be under pressure when the tube is less than 5 TORR MV open again
  - (5).將所有 N2 GAS打開 。
  - (5).Turn all N2 GAS on.

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(6).PURGE後即可進行低溫測漏。

(6).After PURGE can enter low temperature leakage.

十三、T-BAWL 傳送CHECK(參考技資G3363-1010)，只需CHECK FORK-5即可。

每次 BPM need clean counter sensor with air gun。

LP 管:每次 BPM clean 一次。

13. T-BAWL sends CHECK (Refer to technology information G3363-1010), only CHECK FORK-5

Every BPM need clean counter sensor with air gun. LP pipe: once every BPM clean

十四、低溫測漏：

14. Low temperature leak detection

(1). 關所有GAS VALVE直至壓力抽至 0.00 TORR。

(1). Close all GAS VALVE until the pressure reaches 0.00 TORR

(2). 關 SV、MV 作測漏，規格為漏率小於0.00 TORR/ 130 SEC

(2). Off SV, MV do leak detection, specifications for the leakage rate is less than 0.00 TORR / 130 SEC

十五、如果測漏不過則請進行抓漏，找出漏處並解決後再作測漏，直至漏率合乎規格。

15. If leaky, but please carry out leaks, to find the leak and solve the leak after the leak until the rate of compliance

十六、低溫測漏通過即可將208V POWER打開升溫。

16. Low temperature leak detection can be 208V POWER open to heat up

十七、作升溫PURGE：

升溫PURGE方式同低溫PURGE，不同點是 B/E 需連同PEDESTAL、BOAT一起至P04，升溫PURGE步驟請至少執行1小時才可進行下一步驟。

17. For heating PURGE

Heating PURGE mode with the low temperature PURGE, the difference is that B / E with PEDESTAL, BOAT together to P04, Please perform the heating PURGE step at least 1 hour before proceeding to the next step.

十八、高溫測漏：

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## 18.High temperature leak detection P04

方法與規格皆和低溫測漏同，如果不過表示有漏須抓漏，直至通過方可進行下一步驟。

Methods and specifications are the same with the low-temperature leak detection, but if there is leakage to be missed, until the next step can be carried out through

十九、將機台內部及四周用LOW VACCUM與IPA 清潔乾淨。

Clean inside and around the machine with LOW VACUUM and IPA

二十、Burn box 清潔程序(附圖六)

## 20. Burn box cleaning procedure.(Figure 6)

操作程序：

- (1). 戴上呼吸防護器具及防護手套。
- (2). 拆下 BURN BOX COVER，以活動板手固定之螺帽及 WASHER，將拆下之零組件擺放適當位置。
- (3). 將 BURN BOX COVER DORP UP，拿起 O-RING 置於無塵布上，以 LOW VACUUM 口朝向 BURN BOX 內緣，並以起子刮除附著於 WALL 上之 POWDER，CLEAN COVER 表面，清除乾淨。
- (4). 用 IPA 擦拭 O-RING 及 SEAL RANGE 處及整個 BODY。
- (5). 固定 O-RING 於 COVER SEAL 處，並對準 BURN BOX 內緣套入 BODY 之螺孔，拿取拆下之螺帽 WASHER 旋轉固定之，以防 POWDER 外漏。
- (6). 清除週邊之 POWDER 沉積物，用預先準備之透明夾鏈袋，裝入沾有沉積物之無塵布及手套等，袋口密封繫實丟入酸類 (藍色小方型垃圾桶) 結束 BURN BOX MAINTENANCE 之 PROCEDNRE。

Operation section:

- (1). Wear respiratory protective gear and protective gloves.
- (2). Remove the BURN BOX COVER and place the removed components in the proper position with the nut and WASHER fixed by the movable wrench.
- (3). Place the BURN BOX COVER DORP UP, pick up the O-RING on the clean cloth, and point the LOW VACUUM port to the BURN.

The inner edge of the BOX is scraped off with a screwdriver to remove the POWDER, CLEAN COVER surface attached to the WALL.

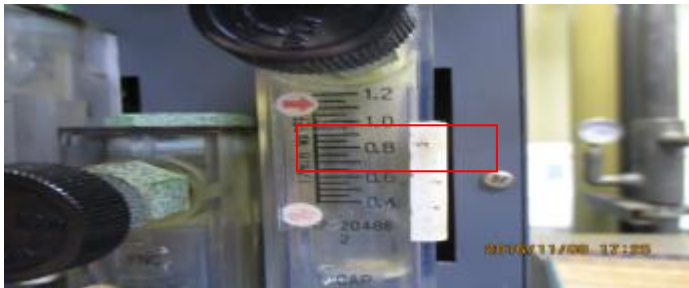


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- (4). Wipe O-RING and SEAL RANGE with IPA and the entire BODY.
- (5). Fix O-RING at COVER SEAL and insert the BODY screw hole into the inner edge of BURN BOX. Take the removed nut WASHER and fix it to prevent POWDER from leaking.
- (6). Remove the surrounding POWDER deposits, use a transparent zipper bag prepared in advance, and put in a dust-free cloth and gloves with deposits. The bag mouth seal is thrown into the acid (blue small square trash can). PRORNDNRE of BURN BOX MAINTENANCE.

二十一、SPM/BPM 請 Check CAP Flow Meter 浮球 動作 & 機台 alarm 功能是否正常。

21. SPM / BPM should check if CAP Flow Meter floating ball movement & equipment alarm function are normal.



二十二、SPM/BPM 檢查電磁閥有無漏氣或脆化，若有不良則更換。

22. SPM/BPM Check the solenoid valve for air leakage or embrittlement, and replace it if it is defective.

二十三、Normal-Open Valve 電磁閥每5年定期更換一次。

23. Normal-Open Valve solenoid valves are regularly replaced every 5 years.

二十四、將機台復歸為STANDBY狀態並執行COT程式，通知EA FOLLOW TEST RUN，於記錄本上註明做TEST RUN並簽名。

TEST RUN：即 RUN 一個平常 RUN 貨的 RECIPE 以量測其厚度，PARTICLE。如果均合乎規格即可交給生產線 RUN 貨，大PM保養工作至此完成。

24. The machine will revert to STANDBY state and the implementation of COT program, notify th EA FOLLOW TEST RUN, in the note on the record to do TEST RUN and signature.

TEST RUN: RUN a normal RUN goods RECIPE to measure the thickness, PARTICLE. If all meet

the specifications to the production line RUN goods, large PM maintenance work is complete

二十五、機台 TEST RUN 後，設備工程師需於機台 STANDBY 時，確認 PS1 PRESSURE=30TORR。

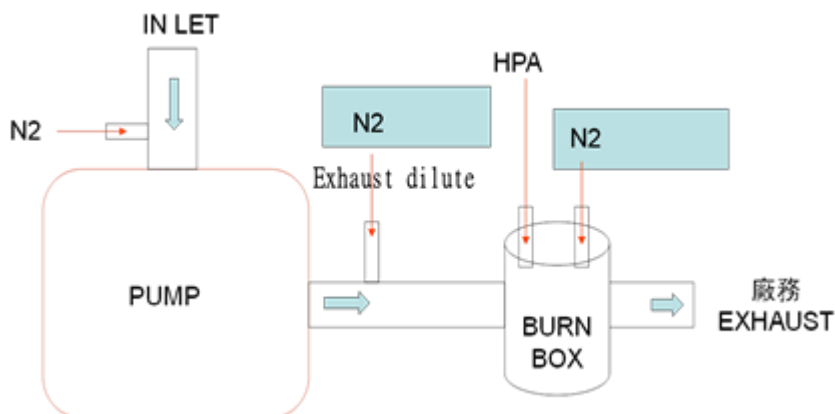
25. After the machine TEST RUN, the equipment engineer needs to confirm the PS1 PRESSURE = 30TORR when the machine STANDBY.

二十六、歲修期間機台負責全廠 PUMP DOWN SIH4 GAS 程序步驟如下：

(1).機台 Burn box N2 & HPA FLOW 調整(由 HPA 80 L → 改為 N2 30L + HPA 25L)

During the annual repair period, the machine is responsible for the whole plant PUMP DOWN SIH4 GAS procedure as follows:

(1).Machine Burn box N2 & HPA FLOW adjustment (from HPA 80 L → to N2 30L + HPA 25L)



(2). 機台 CHAMBE 溫度由 300度升至 620度

(2). Machine CHAMBE temperature rises from 300 degrees to 620 degrees

(3). 機台抽真空抽至底壓(<0.01 TORR)

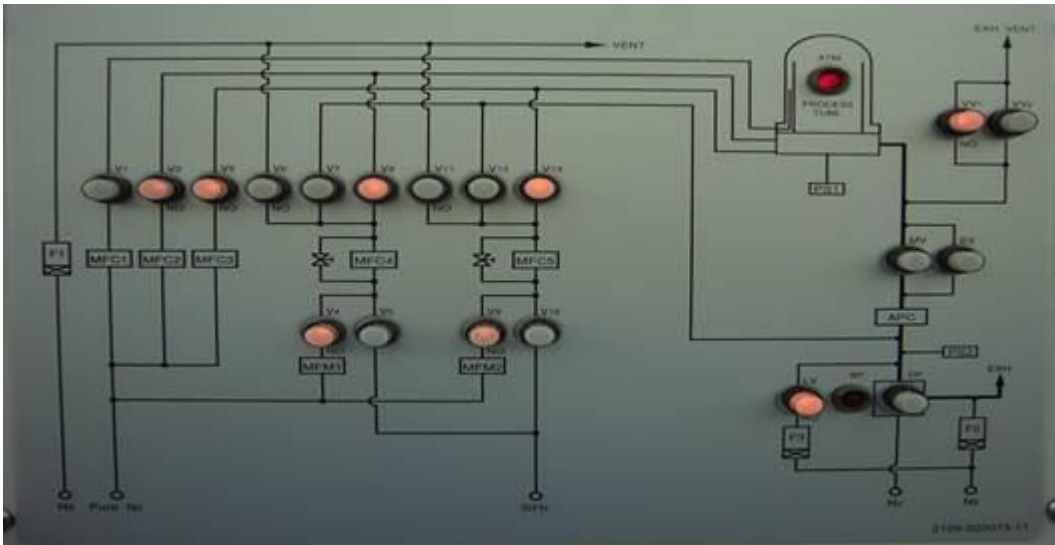
(3). Vacuum pumping to bottom pressure (<0.01 TORR)

(4). SIH4 MFC(MFC4/MFC5) FLOW SET 200 SCCM

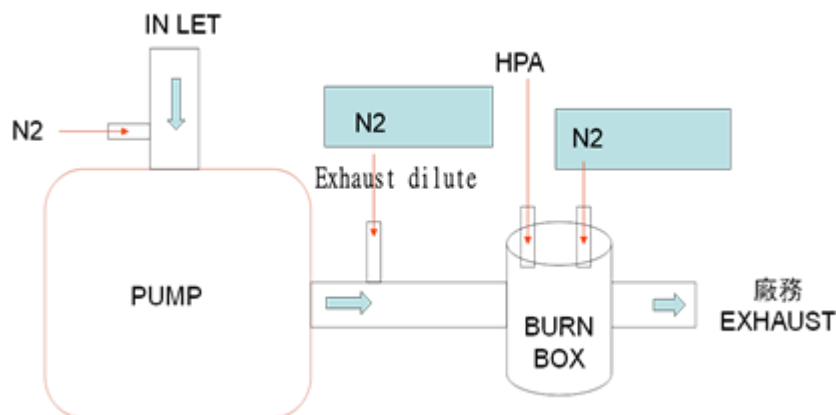
(5). SIH4氣體管路通至CHAMBER TUBE內之AIR VALVE(V5,V8,V10,V13) OPEN ,  
此時開始抽SIH4氣體

(6). The SIH4 gas line leads to the AIR VALVE (V5, V8, V10, V13) OPEN in the CHAMBER TUBE, At this point the pumping of SIH4 gas starts





- (7). 抽氣體持續2~3分鐘後, 將SIH4 MFC(MFC4/MFC5) FLOW SET 500 SCCM
- (7). After pumping gas for 2~3 minutes, set SIH4 MFC (MFC4/MFC5) FLOW SET 500 SCCM
- (8). 此機台必須抽到 CHAMBER PRESSURE等於0.00 TORR , 且SIH4 Regulator指針須至 -76kgf/cm<sup>2</sup>
- (8). This machine must draw CHAMBER PRESSURE equal to 0.00 TORR, and SIH4 Regulator hands must reach -76kgf/cm<sup>2</sup>
- (9). 回報GAS PUMP DOWN OWNER(S500) 已完成
- (9). Report GAS PUMP DOWN OWNER (S500) Completed
- (10). 若完成SIH4 PUMP DOWN ,將機台 SIH4 二次盤 MANUAL VALVE CLOSE, 廠務做SIH4管路N2保壓
- (10). If SIH4 PUMP DOWN is completed, set the machine to SIH4 secondary disk MANUAL VALVE CLOSE, and the factory will do SIH4 pipe N2.
- (11). 將機台208V POWER OFF , 降溫並持續 PG
- (11). Turn off the machine 208V POWER, cool down and keep PG
- (12). CHAMBER PURGE N2 FLOW SET MFC1/MFC2/MFC3:3L/2L/2L
- (13). Burn box N2 & HPA FLOW 調整復歸 (由 N2 30L + HPA 25L → 改回 HPA 80 L)
- (13). Burn Box N2 & HPA FLOW Reset (from N2 30L + HPA 25L → Back to HPA 80 L)



13.機台必須降溫到200度以下才可以將 110V POWER OFF

The machine must be cooled below 200 degrees to turn 110V POWER OFF

捌、生效與修訂

## VIII. Effectiveness and revision

本規範之公佈實施及其修訂核准層級皆依會簽/核決/分發依循範例為之。

The announcement, implement, revise and approval level of regulations are depend on conference memorandum / approval issues/ distributing are according to criteria examples.

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玖、附件

IX. Attachment

Poly

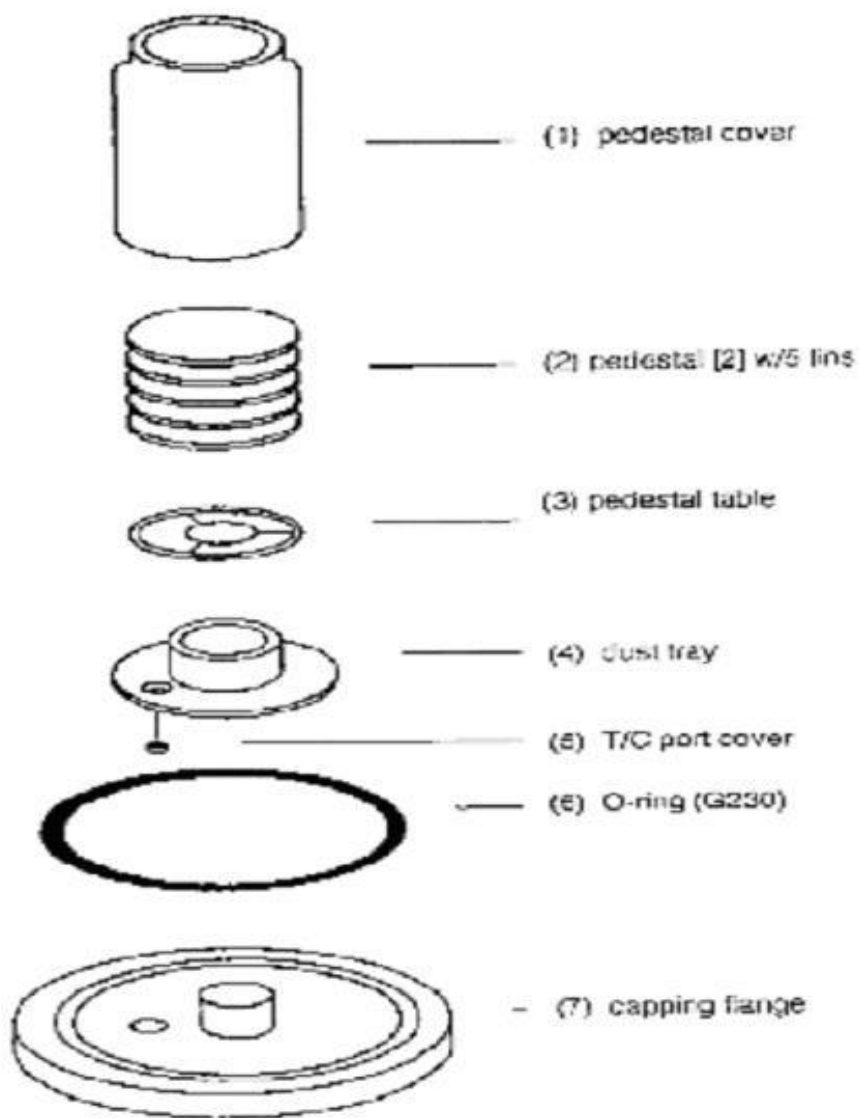
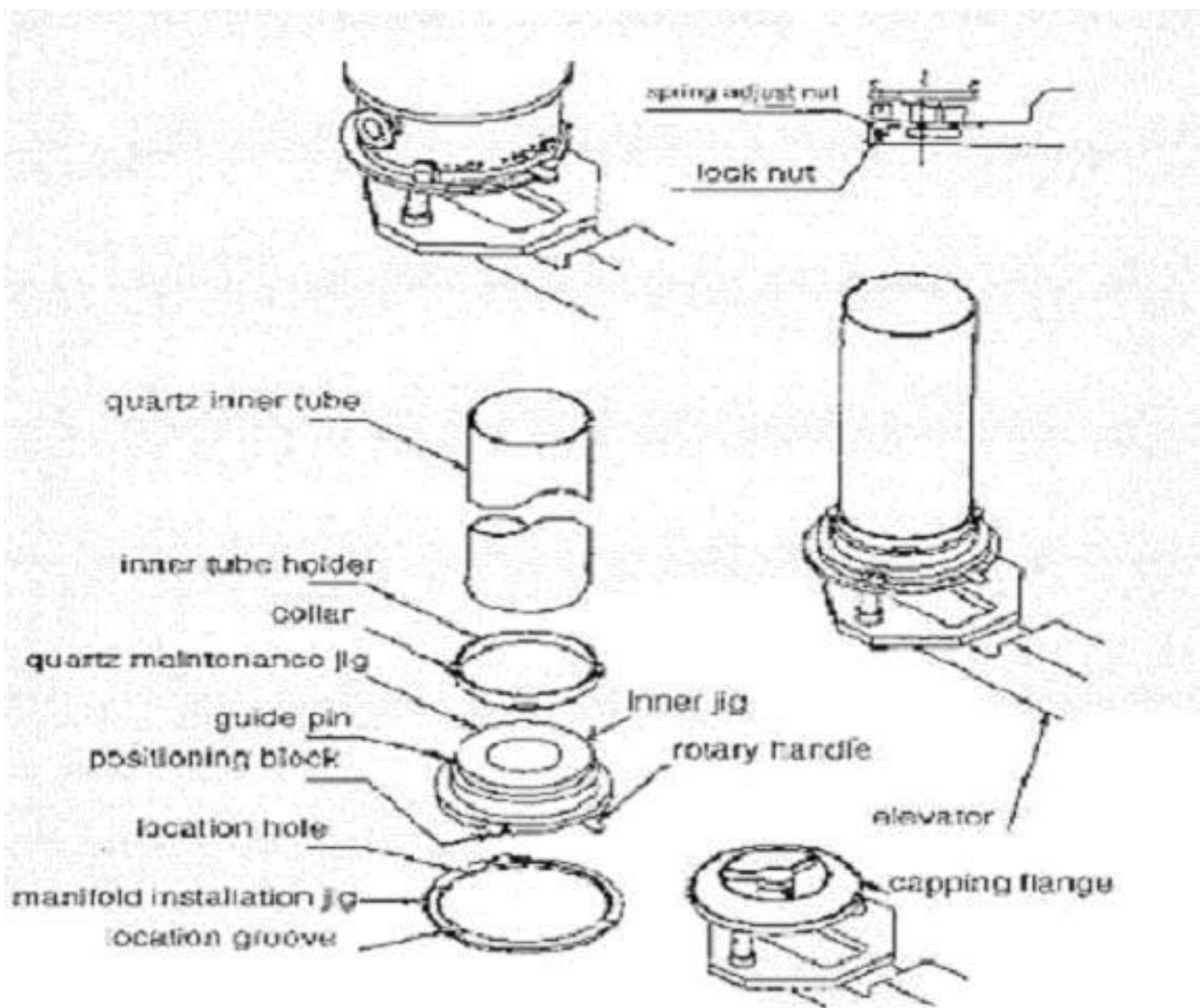


FIG. 3

圖一

Figure 1



圖二

Figure 2

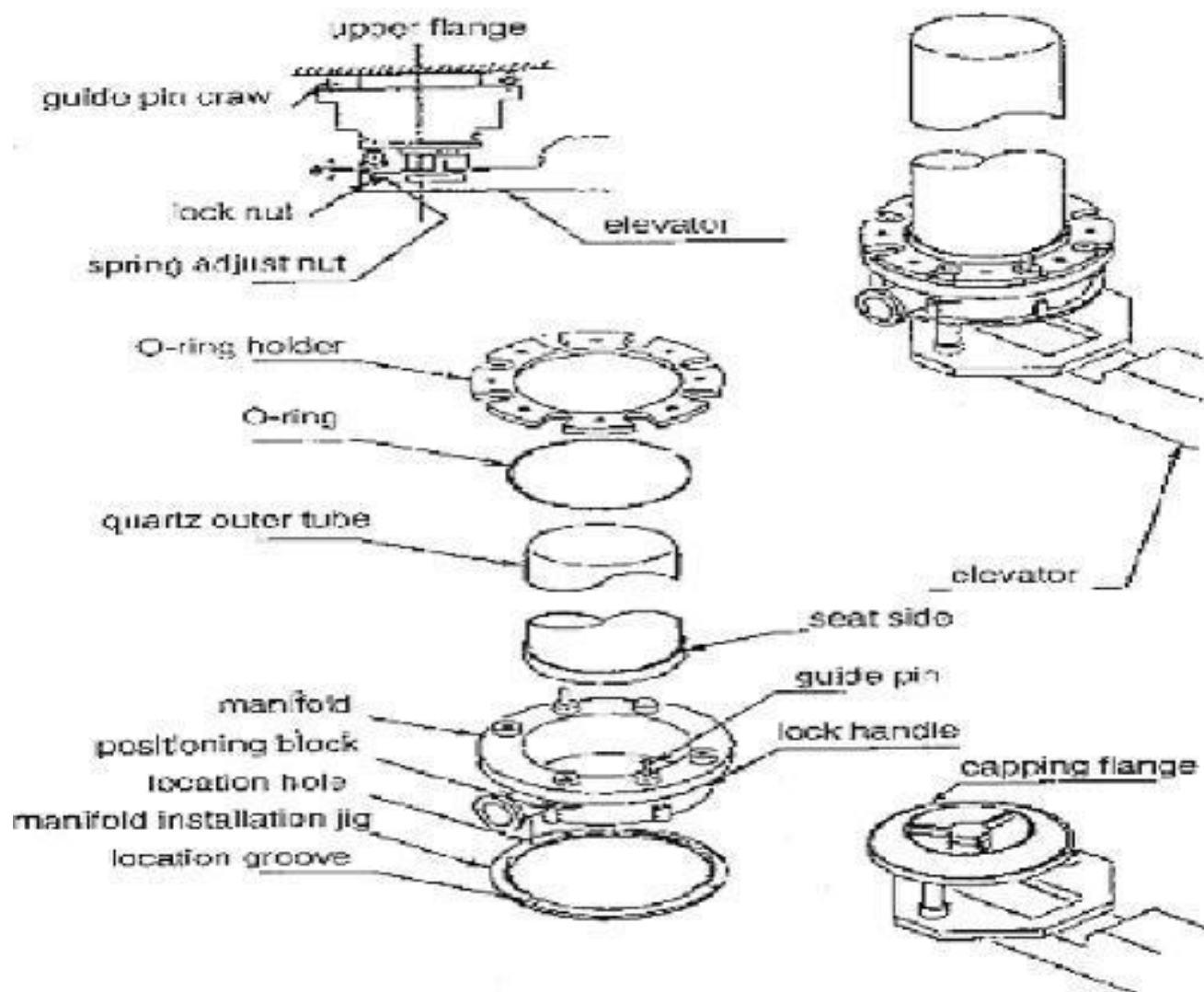
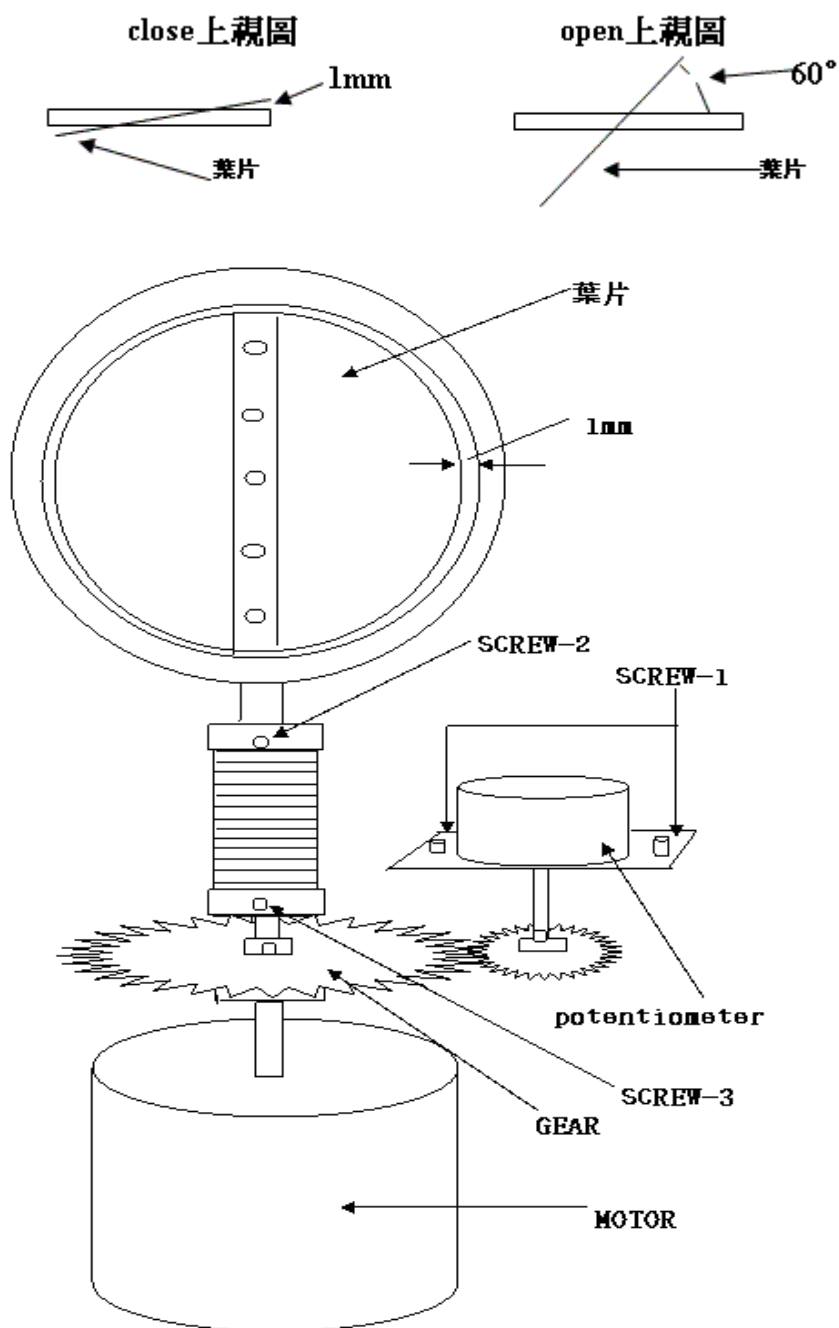


FIG. 5

圖三

Figure 3



圖四

Figure 4

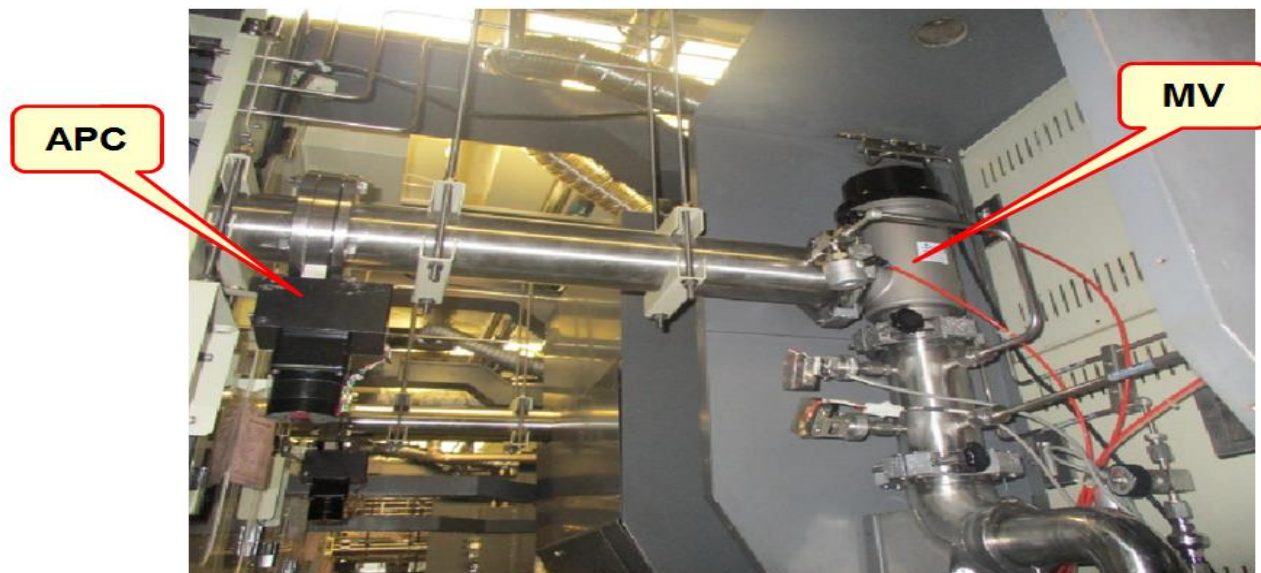


圖五

Figure 5

**APC** - Automatic Pressure Controller

**MV** - Main valve



## Remove APC Automatic Pressure controller



1. Unplug APC power (backside of machine)



2. Disconnect APC power cable



3. Remove APC mounting screw x4



4. Slowly pull down to remove APC



## Remove MV Main Valve



1. Disconnect air hose to solenoid valve



2. Remove 2 Clamp



3. Pull up slowly and remove MV

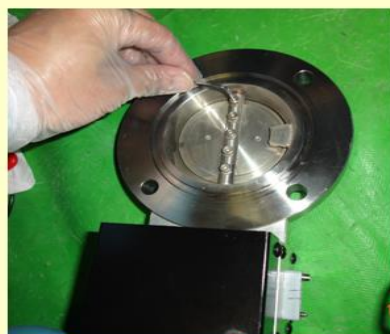
## APC Assembly and Cleaning Procedure

### APC Assembly

APC Shutter



APC Motor – control rotation of shutter



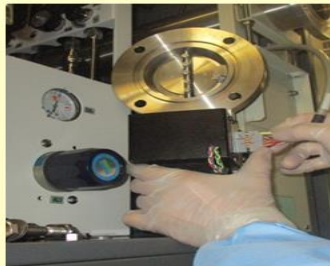
1. Remove APC shutter screw (x5)



2. Clean APC Parts using cloth and IPA then Install

## APC Test

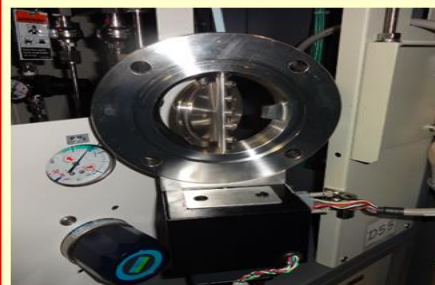
- in front of machine controller move APC set OPEN and CLOSE 3 times



1. Assemble APC and connect power supply



2. Move to CLOSE and check value  $\rightarrow 25 \pm 5$

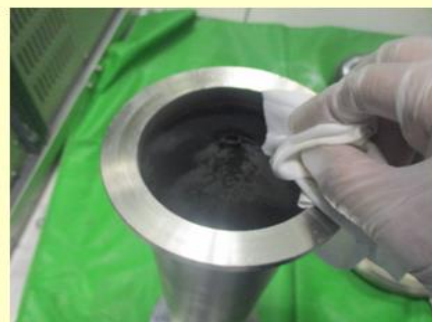
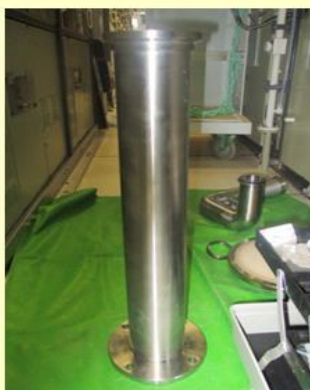


3. Move to OPEN and check value  $\rightarrow 500 \pm 5$

## Exhaust piping cleaning



1. Remove SV pipe to clean exhaust pipe



2. Bring down exhaust pipe and clean by cloth and IPA, then install



## MV Cleaning Procedure



1. Remove x6 screw on top to open MV



2. Disconnect MV parts



3. Clean MV housing using cloth + IPA



4. Clean valve seal and replace all o-ring. And assemble to install

圖六

Figure 6

## BURN BOX Cleaning Procedure



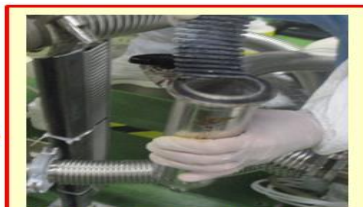
1. Remove burn box top cover (3screw)



2. Clean inside burn box using low vacuum



3. Remove particle catcher to clean



4. Use low vacuum to clean particles



5. Clean pipe to pump