

Slurry delivery unit slurry pipe line periodical flushing inquiry

Target

This inquiry is over periodical flushing of pump, damper, and slurry piping inside the Slurry Delivery Unit.

Applicable tool

Slurry Delivery Unit (Auxiliary unit of DGP8761CMP/HC/SC)

Cleaning importance

Slurry residue will be accumulated and crystallize within pump, damper, and piping when long time not been flushed, high possibility of causing parts breakage.

Periodical flushing is the key to keep good tool condition.

Side effect of not flushing periodically

1. Pump/ damper internal breakage
2. Abnormal flow amount error due to the clog of the flow controller or valve.

Flushing frequency

Flush frequency of once in 3 days.

Slurry crystallization timing is largely depending on the slurry type and its characteristics.

*From the past experience, even circulating slurry inside the Slurry Delivery Unit, fluid start changing into gel-like over 3 days circulation on certain slurry type.

Recommend finish using the prepared slurry within 3 days and dispose & flush slurry if prepared slurry exceeds more than 3days.

Note

Please perform slurry disposal and flush on occasion of the long tool shut down.

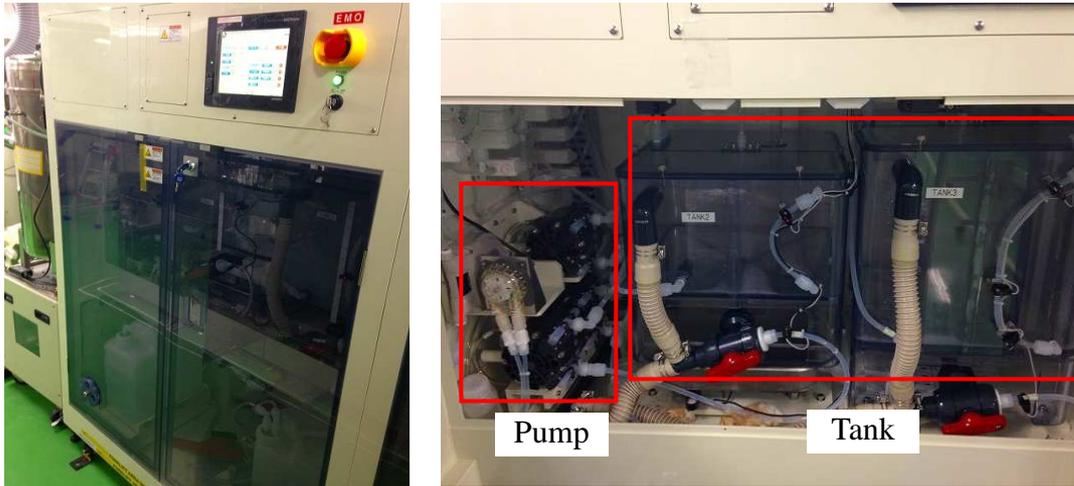
There are two types of slurry delivery unit. Refer to the picture on next page for the identification and follow sufficient procedure Flushing procedure is stated from 3rd page or after.

Contact window

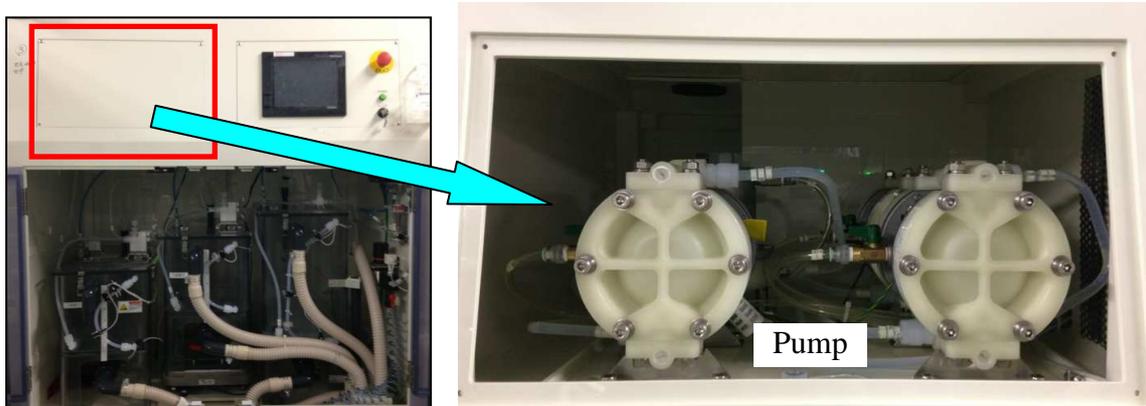
If there is any issue, please contact nearest local sales or customer engineer.

Applicable Slurry Delivery Unit

Type1. Pump and tank is on the same level

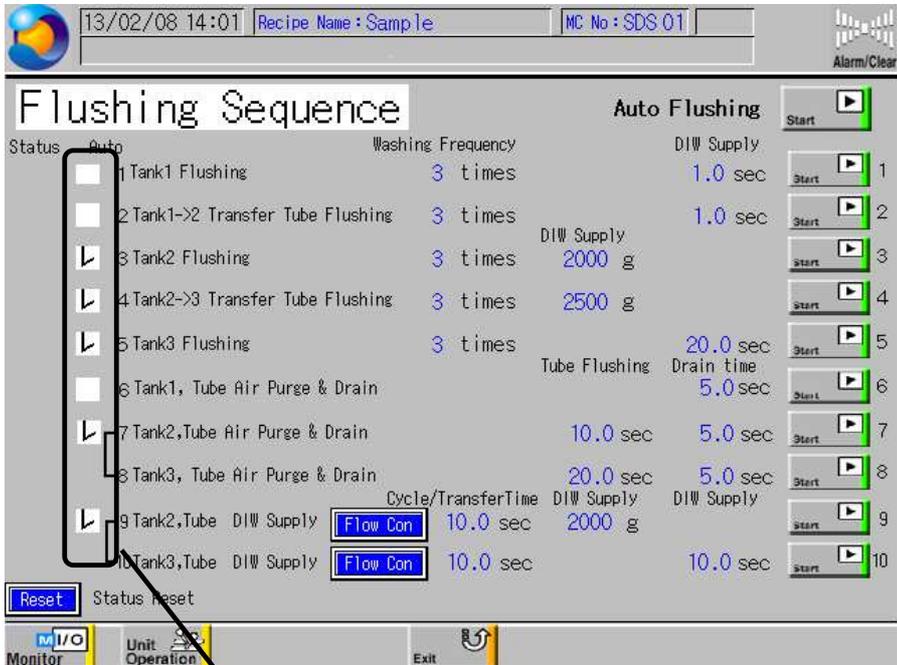


Type2. Pump is located on upper space of the tank.

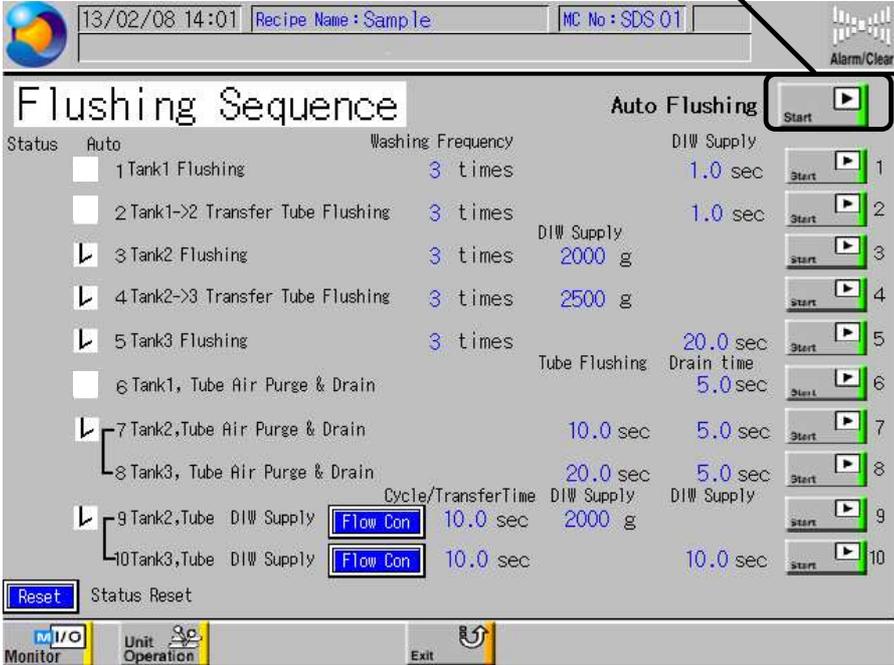


<Type1> Cleaning Tanks and Piping

Procedure for cleaning tanks

Step No.	Procedure																																																							
1	Put on protective gloves (waterproof and impermeable), impermeable apron and safety goggles.																																																							
2	Start up the unit. →For the procedure of starting up the unit, refer to Section 3-1 [Starting up the Unit].																																																							
3	If cleaning Tank1's piping Ask maintenance personnel to install an empty undiluted solution tank in Tank1. If not cleaning Tank1's piping Proceed to Step 4.																																																							
4	 <p>Press Maint. on the operation panel.</p> <ul style="list-style-type: none"> The <Flushing Sequence> screen will be displayed. 																																																							
5	<p>Check that the check boxes are selected as shown in the image below.</p> <ul style="list-style-type: none"> If cleaning Tank1's piping, also select check boxes 1, 2, and 6 in the screen.  <p>The screenshot shows the 'Flushing Sequence' screen with the following details:</p> <table border="1"> <thead> <tr> <th>Status</th> <th>Auto</th> <th>Washing Frequency</th> <th>DIW Supply</th> <th>Start</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>1 Tank1 Flushing</td> <td>3 times</td> <td>1.0 sec</td> <td>Start</td> </tr> <tr> <td><input type="checkbox"/></td> <td>2 Tank1->2 Transfer Tube Flushing</td> <td>3 times</td> <td>1.0 sec</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>3 Tank2 Flushing</td> <td>3 times</td> <td>2000 g</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>4 Tank2->3 Transfer Tube Flushing</td> <td>3 times</td> <td>2500 g</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>5 Tank3 Flushing</td> <td>3 times</td> <td>20.0 sec</td> <td>Start</td> </tr> <tr> <td><input type="checkbox"/></td> <td>6 Tank1, Tube Air Purge & Drain</td> <td>Tube Flushing</td> <td>Drain time 5.0 sec</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>7 Tank2, Tube Air Purge & Drain</td> <td>10.0 sec</td> <td>5.0 sec</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>8 Tank3, Tube Air Purge & Drain</td> <td>20.0 sec</td> <td>5.0 sec</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>9 Tank2, Tube DIW Supply</td> <td>Cycle/TransferTime 10.0 sec</td> <td>DIW Supply 2000 g</td> <td>Start</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>10 Tank3, Tube DIW Supply</td> <td>10.0 sec</td> <td>DIW Supply 10.0 sec</td> <td>Start</td> </tr> </tbody> </table> <p>Buttons: Reset, Status Reset, Monitor, Unit Operation, Exit.</p>	Status	Auto	Washing Frequency	DIW Supply	Start	<input type="checkbox"/>	1 Tank1 Flushing	3 times	1.0 sec	Start	<input type="checkbox"/>	2 Tank1->2 Transfer Tube Flushing	3 times	1.0 sec	Start	<input checked="" type="checkbox"/>	3 Tank2 Flushing	3 times	2000 g	Start	<input checked="" type="checkbox"/>	4 Tank2->3 Transfer Tube Flushing	3 times	2500 g	Start	<input checked="" type="checkbox"/>	5 Tank3 Flushing	3 times	20.0 sec	Start	<input type="checkbox"/>	6 Tank1, Tube Air Purge & Drain	Tube Flushing	Drain time 5.0 sec	Start	<input checked="" type="checkbox"/>	7 Tank2, Tube Air Purge & Drain	10.0 sec	5.0 sec	Start	<input checked="" type="checkbox"/>	8 Tank3, Tube Air Purge & Drain	20.0 sec	5.0 sec	Start	<input checked="" type="checkbox"/>	9 Tank2, Tube DIW Supply	Cycle/TransferTime 10.0 sec	DIW Supply 2000 g	Start	<input checked="" type="checkbox"/>	10 Tank3, Tube DIW Supply	10.0 sec	DIW Supply 10.0 sec	Start
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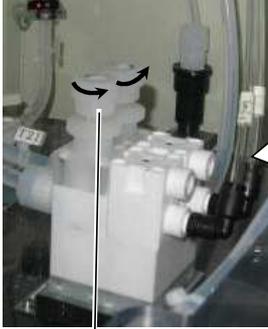
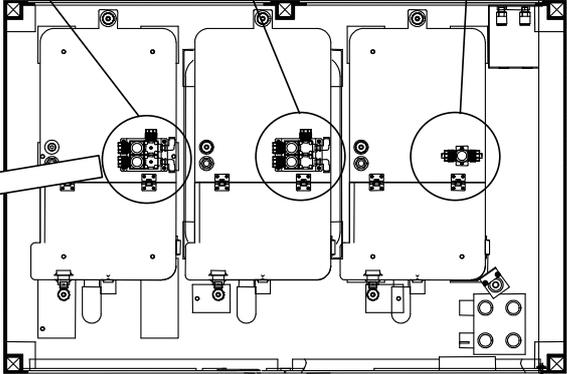
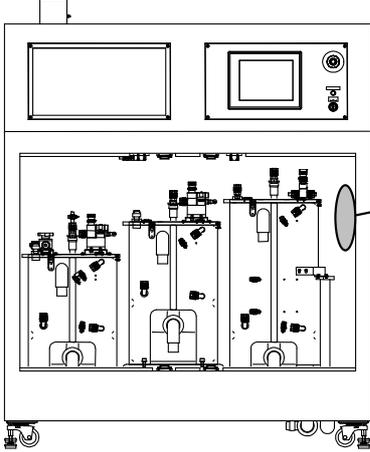
Procedure for cleaning tanks (Continued)

Step No.	Procedure
6	<p data-bbox="387 566 1133 640">Press the  button to start cleaning tanks and piping. • The "Auto Flushing" sequences are performed.</p> <p data-bbox="1027 663 1209 689">Press this button</p> 

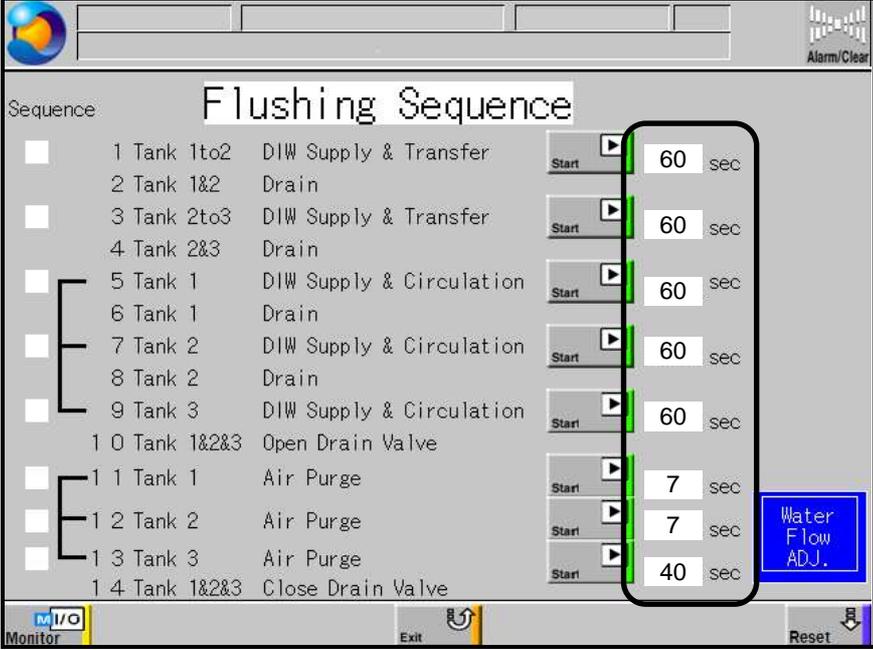
Continued to the next section.

<Type2> Cleaning Piping

Procedure for cleaning piping

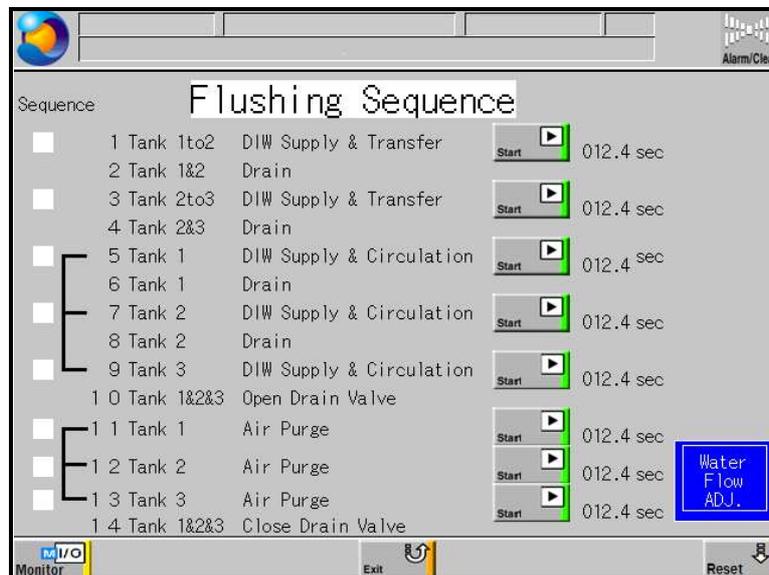
Step No.	Procedure (Continued from the previous section)
1	<p>Manually turn the needle valves (5 places) of tanks 1 to 3 of the slurry delivery system counterclockwise to open them fully.</p> <div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <div data-bbox="662 607 847 658">Needle valves (For tank 1: 2 pcs.)</div> <div data-bbox="890 607 1075 658">Needle valves (For tank 2: 2 pcs.)</div> <div data-bbox="1129 607 1315 658">Needle valve (For tank 3: 1 pcs.)</div> </div> <div style="display: flex; align-items: center;">   </div> <p style="margin-top: 10px;">Turn the needle valves counterclockwise to open them fully.</p> <p style="text-align: center; margin-top: 10px;">Slurry delivery system: Top view (inside of the cover)</p> <div style="text-align: right; margin-top: 20px;">  Machine front </div>
2	<p>Manually turn the needle valve of the deionized water flowmeter shown below counterclockwise to open it fully.</p> <div style="display: flex; align-items: center; margin-top: 20px;">   </div> <p style="margin-top: 10px;">Needle valve</p> <p style="margin-top: 10px;">Deionized water flowmeter</p> <p style="text-align: center; margin-top: 10px;">Slurry delivery system: Front view (inside of the cover)</p>
3	<p>Close the front cover of the slurry delivery system.</p>
4	<div style="display: flex; align-items: center; margin-bottom: 10px;">  <p>Press</p> </div> <p>on the operation panel of the slurry delivery system.</p> <ul style="list-style-type: none"> • The <Flushing Sequence> screen will be displayed.

Procedure for cleaning piping (Continued)

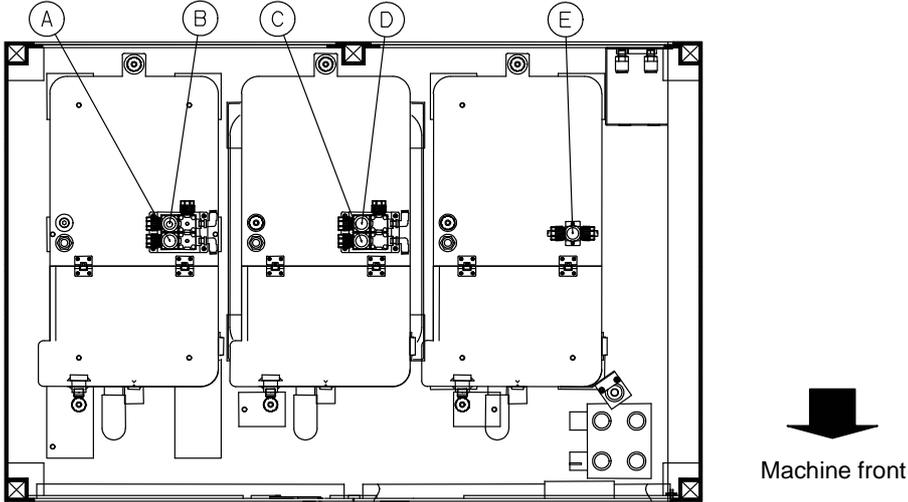
Step No.	Procedure
5	When any marks are set in the check boxes at the left of each sequence, press <Reset> button to reset the status of the check boxes.
6	<p>Set the times to perform cleaning of tank1, tank2 and tank3 as shown below.</p> 
7	<p>Execute the procedures from 1 to 4 in the screen of the slurry delivery system.</p> <ul style="list-style-type: none"> • When the <Start> button is pressed, sequences 1 and 3 in the screen will be executed automatically. Once each procedure is executed, the check box at the left side of the screen will be marked. • For the sequences specified as "Drain," drain each tank manually while referring to Section 3-5-1 [Cleaning Tanks]. Drain water after the previous procedure finishes. Once water is drained, close the drain valve of the tank, and press the <Start> button for the next procedure.
8	<p>Press the <Start> buttons for the sequences 5, 7, and 9 in the screen of the slurry delivery system.</p> <ul style="list-style-type: none"> • The sequences 5, 7, and 9 can be performed concurrently.
9	<p>Referring to Section 3-5-1 [Cleaning Tanks], drain each tank manually.</p> <ul style="list-style-type: none"> • Clean the tanks if necessary. • This step corresponds to the sequences 6, 8, and 10 in the <Flushing Sequence> screen. • When all the tanks are completely drained, close the front cover of the slurry delivery system. • Keep the drain valves of the tanks open.

Procedure for cleaning piping (Continued)

Step No.	Procedure
10	<p>Press the <Start> buttons for the sequences 11, 12, and 13 in the screen of the slurry delivery system.</p> <ul style="list-style-type: none"> The sequences 11, 12, and 13 can be performed concurrently. In these sequences, a pump sucks the liquid remaining in pipes so that the pipes are drained. It is impossible to remove all drops of liquid remaining in the pipes. The sequence 13 is executed to drain the pipe connecting the slurry delivery system with the DGP8761. The standard setting value (40 seconds) is provided on the assumption of the piping system described in Section 2-2 [Installation Diagram]. Change the setting value according to the length of each pipe. If a too long time period is specified for the sequence 11, 12, or 13, the pump may keep sucking with no liquid left in the pipe, which may shorten the life of the pump.
11	Open the front cover of the slurry delivery system.
12	Close the drain valves of tanks 1 to 3 of the slurry delivery system by turning them counterclockwise by hand.
13	Close the front cover of the slurry delivery system.
14	Repeat the procedure from Step 7 to 13 twice.
15	<p>Put a tank with water in front of the slurry delivery system.</p> <ul style="list-style-type: none"> Fill the tank with 10 L or more.
16	<p>In the same procedure as Steps from 3 to 9 of Section 3-2 [Starting Slurry Supply], pump the water in the tank readied in Step 15 from the slurry undiluted solution supply tube.</p> <ul style="list-style-type: none"> This step is performed to remove slurry remaining in the slurry undiluted solution supply tube by flushing the tube with water. After flushing the tube with water for 3 minutes, pull out the tip of the tube from the water and wait until all the water inside the tube is pumped.
17	Stop pumping water by pressing the <Stop> button on the operation panel of the slurry delivery system.
18	Close the hand valve attached to the slurry undiluted solution supply tube of the slurry delivery system.
19	<p>Press the <Water Flow ADJ.> button on the FLUSHING SEQUENCE screen.</p> <ul style="list-style-type: none"> Deionized water is supplied to tank 2.



Procedure for cleaning piping (Continued)

Step No.	Procedure
20	Set the flow rate of the deionized water flowmeter, whose valve you opened fully in Step 2, to “2 L/minute.”
21	Press the <Water Flow ADJ.> button on the FLUSHING SEQUENCE screen. • Deionized water to tank 2 is stopped.
22	Return the slurry undiluted solution supply tube of the slurry delivery system back to the original position.
23	<p>Turn the needle valves of B, C, D, and E shown below clockwise to close them fully.</p> <ul style="list-style-type: none"> • The needle valves have been fully opened in Step 1. • Leave the valve A fully opened. • The appropriate fully-closed position of each valve is where the valve does not move further when you turn it lightly. Applying an excessive force may deform the valve. <div style="text-align: center;">  <p>Slurry delivery system: Top side (inside of the cover)</p> </div>
24	<p>Turn the valves A to E shown in the figure in Step 23 as follows:</p> <ul style="list-style-type: none"> A: 1 revolution (clockwise) B: 1 and a half revolutions (counterclockwise) C: 2 and a half revolutions (counterclockwise) D: 2 revolutions (counterclockwise) E: 1 and a half revolutions (counterclockwise)

Continued to the next section.