Sink5 (Y2)

(sink5)

1.0 Title

Sink5 in the yellow room, Y2.

2.0 Purpose

This document has specific information about wet sink5.

3.0 Scope

Wet Sink5 provides both a **quick soak** and a **long soak**, PRS-3000 photoresist strip bath, as well as a pre-furnace metal clean bath, plus one DI water rinse (QDR) followed by a quick dump. Each chemical bath and/or tank is clearly labeled.

4.0 Applicable Documents

Revision History

Chapter 2.3 of the lab manual (Wet Sinks and Spin Dryers)

Chapter 2.1 of the lab manual, which explains wafer boxes, tweezers, and other tool cleaning prior to using VLSI sink.

5.0 Definitions & Process Terminology

5.1 **Full Plenum Lockout Alarm:** Early warning alarm indicating sink drain failure.

5.2 **Quick dump rinse (QDR):** DI water fills the sink followed by a quick dump to get rid of the PRS-3000 residue.

5.3 **Spin Rinse Dryer (SRD):** DI rinse followed by dry cycle.

6.0 Safety

Never touch any surface while wearing chemical-resistant gloves that other lab members may come into contact with, such as the table tops, door handles, computer keyboards, face shields, aprons, etc. If you need to step away from the sink at any time, rinse off gloves at the glove wash, dry with techni-cloths, and put away in your drawer until you are ready to resume your work at the sink.

Follow general safety guidelines for the lab safety rules outlined in Chapter 2.3 and the following:

6.1 This sink contains two heated PRS-3000 photoresist baths as well as a heated pre-furnace metal cleaning bath; therefore appropriate safety attire should be worn while working at this station.

6.2 Do not adjust the heater controllers as they have been preset to produce proper bath temperatures.

6.3 Only use chemically resistance cassettes provided at the station (Teflon type); failure to do so can cause damage to the station and/or compromise the operator's safety.

6.4 **Dwyer Photohelic Exhaust Flow Meter** (Figure 4): Monitors the sink exhaust flow and will shut down all electricity and water to the sink if there is too much or too little flow. An alarm will sound; press the red **SILENCE** button (Figure 3) and promptly report on FAULTS.

6.5 **MPC-901 Emergency Alarm** (Figure 3): Cuts power to the sink in emergencies. Push the big red **STOP** button (Figure 3) to cut the power to this sink. Report promptly on FAULTS.

6.6 **Glove Wash**: Located in the front center of this sink; water spray is sensor activated.

6.7 The flash point of PRS-3000 photoresist stripper is 90ºC. Please always keep flammable material away from this sink.

6.8 Sink5 has an integrated fire suppression system which is tied to the lab and building wide fire alarm system. Activation of the fire suppression system releases large volumes of CO2 directly at the heated tanks and deck area of the sink. Activation of the fire suppression system will activate the lab and building wide fire alarm. Immediately evacuate the lab after activation of the Sink5 integrated fire suppression system.

7.0 Statistical/Process Data

7.1 Please refer to sink 5 enable message for the test data with PRS-3000 Photoresist Stripper at 80ºC.

7.2 **Warning:** Any wafers left in the **quick soak** bath longer than 20 minutes will be removed. Any wafers left in the **long soak** bath more than 8 hours will be removed. When there are wafers in the **long soak** bath without posting a note, the wafers will be removed. This is to make the baths available for others to use. If you believe your process requires more than 8 hours in the PRS-3000 Photoresist Stripper, please ask the process supervisor for special permission.

8.0 Available Processes, Gases, Process

Two drainable PRS-3000 photoresist strip baths are available at this sink as well as a pre-furnace metal cleaning bath, plus one quick dump rinser (QDR) to properly clean the wafers prior to going into the spin rinse dryer 3.

Bath	Chemical	Time	Temperature
Left-Heated Bath	PRS-3000 (quick soak)	5 to 20 min.	80ºC
Center-Heated Bath	PRS-3000 (long soak)	20 min. to 8 hours	80ºC
Right Heated Bath	Pre-Furnace Clean	10 min.	80ºC

Note: When your photoresist on your wafers does not strip off in 20 minutes at 80ºC, then this PRS-3000 may not be the correct photoresist stripper for you.

9.0 Equipment Operation

The sink operation is relatively easy. The main difference between the old and new style VLSI sinks is that at the new sinks members invoke the dump rinse cycle from a keypad mounted on the face of the station.

9.1 Control Key Description

There are six control/displays at this station, see Figures 1 and 2. The three MPC-100 (Figure 2) control panels are for the heated baths: the one on the left is for the PRS-3000 (quick soak), the one in the center for the PRS-3000 (long soak) and the one on the right is for the pre-furnace metal cleaning bath. The **MICROKLEEN RINSE** (Figure 1) control panel is for the quick dump rinse (QDR) station. The QDR is currently set up for two dump rinse cycles. Wafers are initially showered with DI water followed by two DI fill-dump cycles. These cycles end with wafers submerged in the water for operator to extract and place them in SRD. See Figures & Schematics for more details. The station performs an automatic self-cleaning, every 60 minutes by one QDR cycle.

POWER Turns on the control panel.
START Begins a process cycle at any of the control/display panels.
STOP/RESET Stops or interrupts a process cycle at any time.

SAVE/SIL Silences the bath alarm.
HOLD Stops heating the PRS-3000 photoresist strip bath corresponding to the control/ display panels. Press **HOLD** again or **RETURN** to reactivate the heater.
DRAIN Make sure chemicals baths are sufficiently cooled down before draining. See Section 9.5.1 for the proper draining procedure.

9.2 Quick Dump Rinse Operation

9.2.1 Place wafers in the tank; it should initially be empty, if not, press OPEN to drain it. Press **START** button to activate the dump rinse cycle (Figure 1). It will cycle down from 2 to 1 then show 0 in the display window. At the end of the two cycles a beeping alarm will sound. Press **STOP/RESET** to silence the alarm. Upon completion of two rinse cycles remove wafers and place in **SRD**.

9.2.2 **Note:** To drain the DI water, press **OPEN**. This will open the gate at the bottom of the sink. Press **STOP/RESET** to close the gate after the water is drained.

9.3 Hot Bath Controller for the PRS-3000 Photoresist Strip Baths (MPC-100) and the Pre-Furnace Metal Cleaning Bath

9.4.1 Place your wafers in desired bath, either the **quick soak** PRS-3000 bath, for 5 to 20 minutes, or the **long soak** PRS-3000 bath for 20 minutes to 8 hours, or the metal cleaning bath for 10 minutes.

9.4.2 Press time/start button to start the strip process cycle with the preset time and temperature (optional) (Figure 2).

9.4.3 When your strip (or clean) is completed after the preset time, hit the TIME STOP/RESET button to reset the timer.

9.4.4 Remove your wafers and rinse in quick dump rinse #1.

9.4 Draining Chemicals in Sink5 => HANDLED BY PROCESS STAFF ONLY

9.5 Adding Chemicals in Sink5 => Lab members are allowed to add more PRS-3000 to the baths when the L Level warning indicator light is on.

9.5.1 PRS-3000 Photoreist Strip Bath (either one) (Figure 2):

9.5.1.1 Press the **HOLD** button once on the MPC-100 temperature controller panel so that the bath temperature will cool down to 60ºC. **Note:** LED light next to **Heat**, under status column, goes off.

9.5.1.2 Next, flip the toggle switch from **aspirate** to **spigot.** There is a separate toggle switch for each of the tanks.

9.5.1.3 Next, open up the spigot on the bottom left side of sink5. Be sure to have an empty PRS-3000 bottle positioned under it to catch the draining liquid.

9.5.1.4 Each bath drain will fill 2-3 bottles. Label each bottle **Used PRS-3000** and use one of the red and white ID stickers that are on a roll on top of the Chemical Disposal cabinet in Rm. 432B.

9.5.1.5 Place the full labeled bottles into the **Chemicals for Disposal** cabinet and be sure to fill out the manifest as well.

9.5.1.6 Use the deck hose to rinse out the emptied bath; this also gets drained into the waste bottle.

9.5.1.7 Press **DRAIN** button again to close the gate on the bottom of the tank. Fill the bath with fresh PRS-3000.

9.5.1.8 Press **HOLD** button to restart the heater. LED adjacent to **Heat**, under status column, turns on.

9.6 Control Panel Programs are shown in the Appendix.

The parameter codes for the programs on the MPC-100 temperature controllers and Microkleen Rinse are listed on Tables 1 and 2 in the Appendix. The parameter codes are not to be altered by the Microlab members. Please only use them as your reference check.

10.0 Troubleshooting Guidelines

9.3 Rinse cycle stopped in the middle QDR cycles: press open to dump the water out. Press stop/reset key followed by restart the dump rinse cycle from the start.

9.4 No Power to Sink: Several issues can shut the system down.

9.4.1 Power to System Off (Figure 3): Press power ON if no issues have been reported on the Wand or if the system is not under technician's control.

9.4.2 Photohelic Differential Pressure Reading (Figure 4) is outside limits (two red bars): Consult with staff to check house exhaust pressure.

9.4.3 Plenum Full: The plenum on this system is directly connected to fabwide (sink6). Full plenum in sink6 will also stop sink5 operation.

SPIN RINSE/DRYER HELP MESSAGES

HELP-0 **Power Failure**	The power failed while the unit was operating. Check the electrical lines in the unit, and for a blown fuse. Press **START** to reset the microprocessor. The rinser/dryer indexes the rotor and resets to the beginning of the interrupted cycle.
HELP-1 **Bladder Pressure**	There is inadequate nitrogen pressure to inflate the door seal. Check the door bladder, the nitrogen pressure, and the pressure switch. Be sure there is 20-21 psi on RG2 and that the pressure switch turns off when the pressure reaches 17-18 psi.
HELP-2 **Nitrogen Pres**	There is insufficient pressure in the system nitrogen line. Check the nitrogen pressure switch (PSW1). It should be set to approximately 13 psi. Check the system line for leaks. Be sure that the pressure at RG1 is 23 psi dynamic. Check the Clean Coil thermostat and reset if necessary.
HELP-3 **Door Open**	The door is not completely closed. Check the door. If the door is properly aligned, check the micro-switch actuating arm.
HELP-4 **Index Failure**	The unit is not able to index the rotor. Check the rotor positioner.
HELP-5 **Excessive Speed**	The rotor speed has exceeded 3400 RPM. Retry the cycle a few minutes. If the problem persists, there is a hardware problem. Call maintenance or VERTEQ for assistance.

11.0 Figures & Schematics

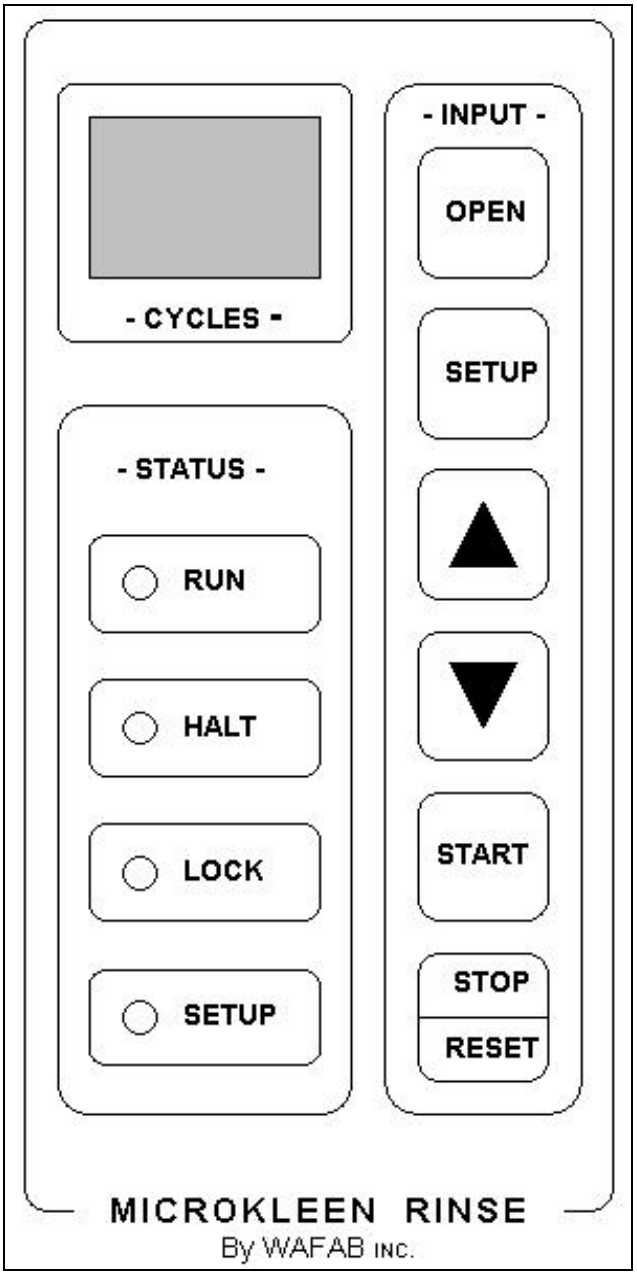

Figure 1 – Quick Dump Rinse (QDR)

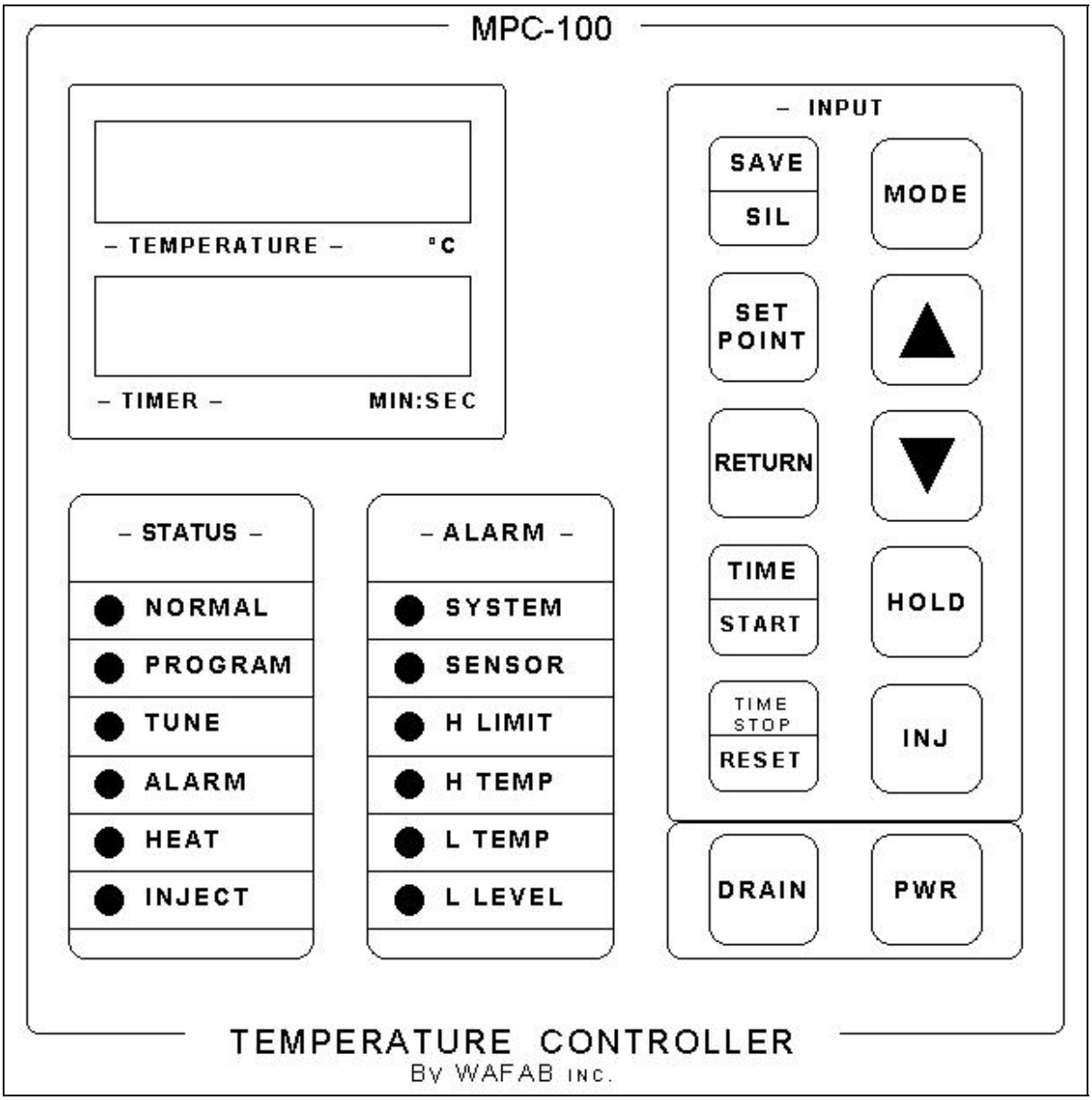

Figure 2 – Hot Bath Temperature Controller

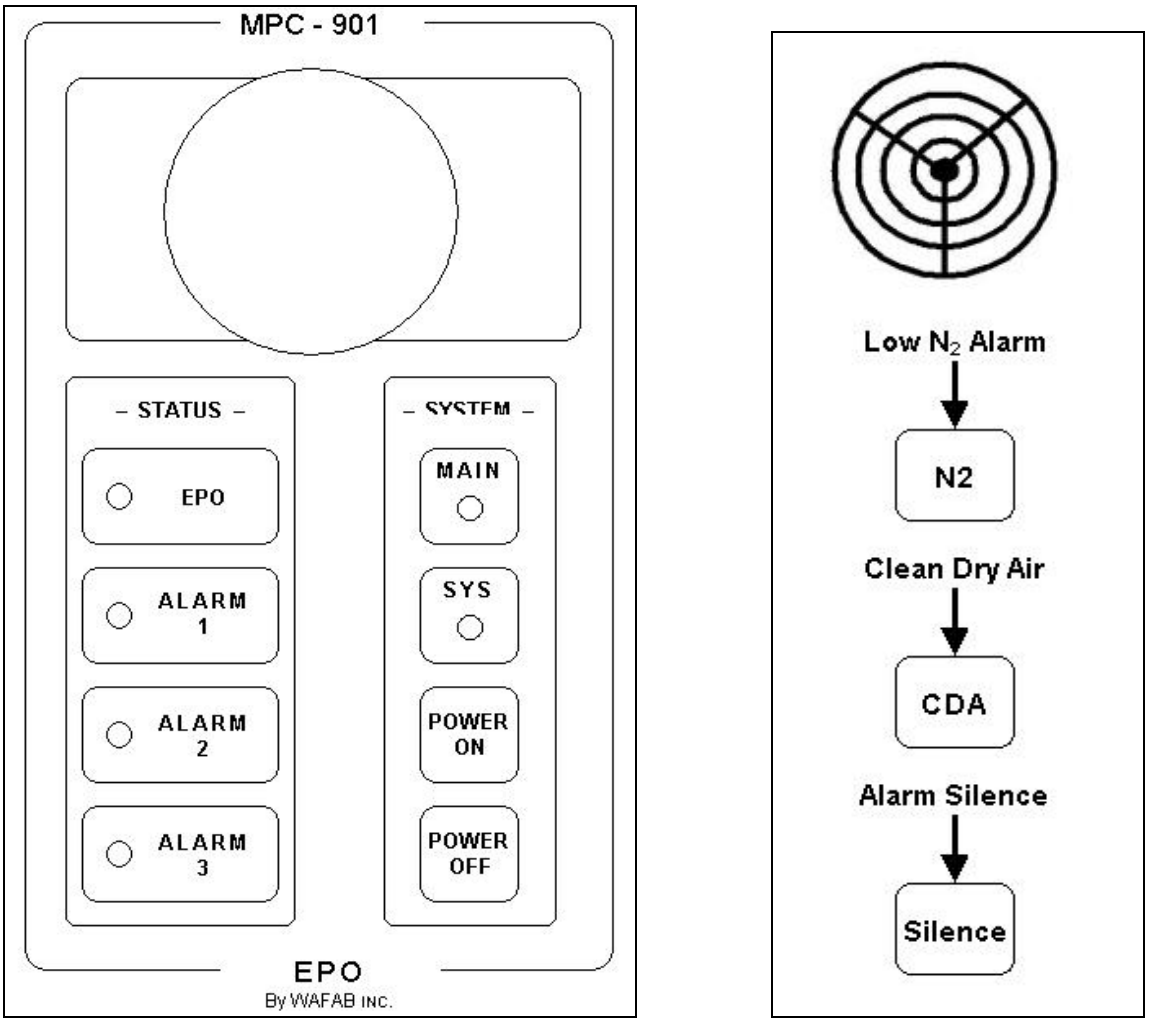

Figure 3 – Main System Power/Alarm Controller

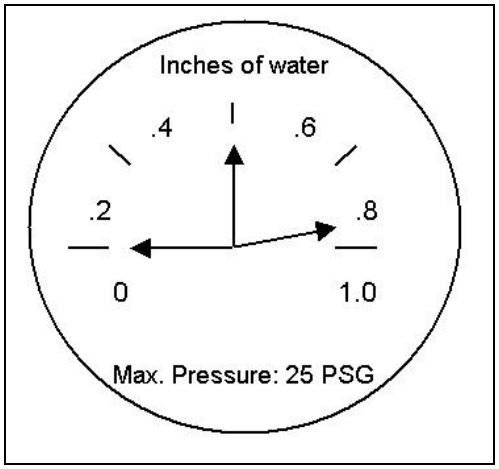

Figure 4 – Photohelic Differential Pressure Gauge

12.0 Appendix

LED Displays

Timer	Temp. (ºC)
Cr	10
Pb	1.0
rE	1.0
rA	0.0
OF	0.0
AC1	00
AC2	00
PS	80.0
dr	40.0

Temp. (ºC)	Timer
dp	10:00

Timer	Temp. (ºC)
HI	10.0
LO	10.0

Temp.(ºC)	Timer
CS	30:00
PA	:30
IP	:00
Cd	d1

Table 1 - Sink5 MPC-100 Hot Bath Temperature Controller Codes

Note: Do not change the recipes. The factory set up codes will be impacted.

LED Displays

Cycles	
CY	2
FP	45
dP	9.9
Sd	4
Ad	0
n2	n
Ac	0
PC	5
Pn	1
nb	10
SL	1

Table 2 - Sink5 MICROKLEEN Quick Dump Rinse Codes

DECK HOSE Instructions

The de-ionized (DI) water deck hose for the sinks is **ALWAYS** available for emergencies; it provides a good safety backup in the event of exposure to chemicals.

If this hose (the black curly cord) develops a leak, please observe the following procedure:

1) Locate the self-closing, stainless steel **quick connect** fitting at the end of the black curly cord.

   Caution! This hose is under pressure, so be sure to wear the following safety apparel before proceeding further:

   - ► **Face shield**
   - ► **Lab apron**
   - ► **Chemical resistant gloves**

   (as the water will spurt a bit)

2) Depress the **quick connect** locking mechanism. The fitting should snap apart quickly, thereby disconnecting the deck hose from its base.

3) Report as a problem on FAULTS.

4) Set the deck hose at the rear of the sink deck for replacement.

Sink5 Study Guide

Be sure to know….

1. What size wafers sink5 handles.
2. Left vs. Right stations.
3. What full plenum lockout means; what to do.
4. Protection for hands and body.
5. Tweezers allowed in the sink.
6. Adjusting heater controls.
7. A complete dump rinse cycle.
8. What to do if it stops in the middle of a quick dump cycle.
9. Easy-to-make mistakes that would contaminate sink station.
10. Activating the glove wash.
11. Loading cassettes into the SRD.
12. Dealing with a leaking deck hose.
13. Disposing of empty chemical bottles.
14. How to cut power to the sinks in an emergency.