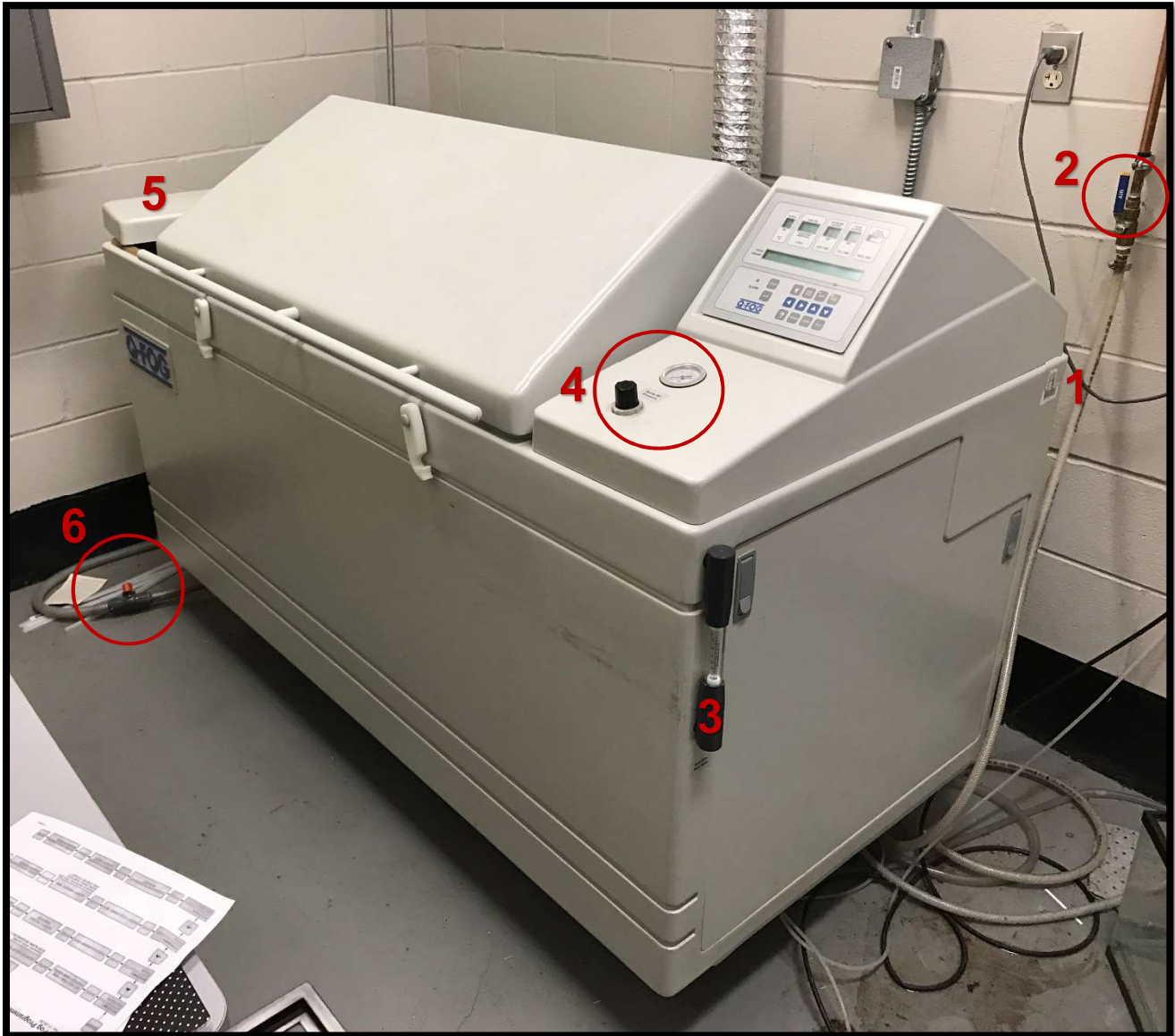


Q Fog Tutorial

1. Basic Operating Procedure for the Q Fog corrosion machine



Reference Figure: (1) power switch, (2) air valve, (3) secondary pressure gauge, (4) pressure gauge and pressure control, (5) salt water reservoir, (6) salt water reservoir drainage valve



Figure 1a: Power off position



Figure 1b: Power on position



Figure 2a: Air Valve Closed



Figure 2b: Air Valve Open

Step 1: turn the power on

Step 2: open the air valve

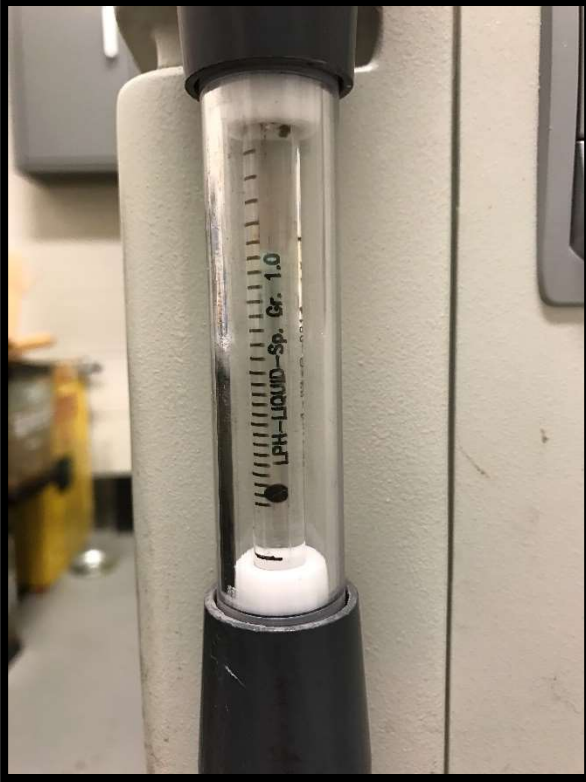


Figure 3: secondary pressure gauge

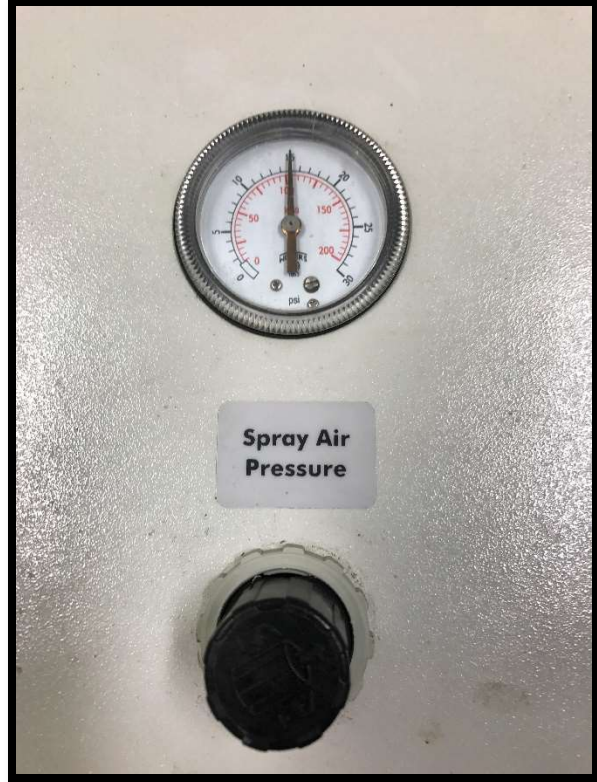


Figure 4: Air pressure gauge and control

Step 3: ensure that the secondary pressure gauge is registering a pressure to ensure that there is air flow through the system (the black ball should be visible)

Step 4: pull up on the air pressure control knob and turn in a clockwise direction to ensure that the spray air pressure is not set to zero

Note: the air pressure control will also be used later to adjust the pressure once a corrosion run has been started

Step 5: ensure that the salt water reservoir is filled with salt water of the appropriate concentration

Note: 3.5% is a typical concentration for salt water as it is approximately what is found in seawater (35 ppm)

Step 6: if the machine has gone unused for a period of time, drain the current water from the reservoir by opening the drainage valve and refill with fresh salt water made with DI water from the dispenser seen in Fig. 8.

Note: as shown in figure 6, the valve is in the closed position. Open the valve by turning it to where it runs in the same direction as the tubing.



Figure 5: Salt water reservoir



Figure 6: Salt water reservoir drainage valve (in the closed position as shown)



Figure 7a: Interior view of Q Fog corrosion compartment

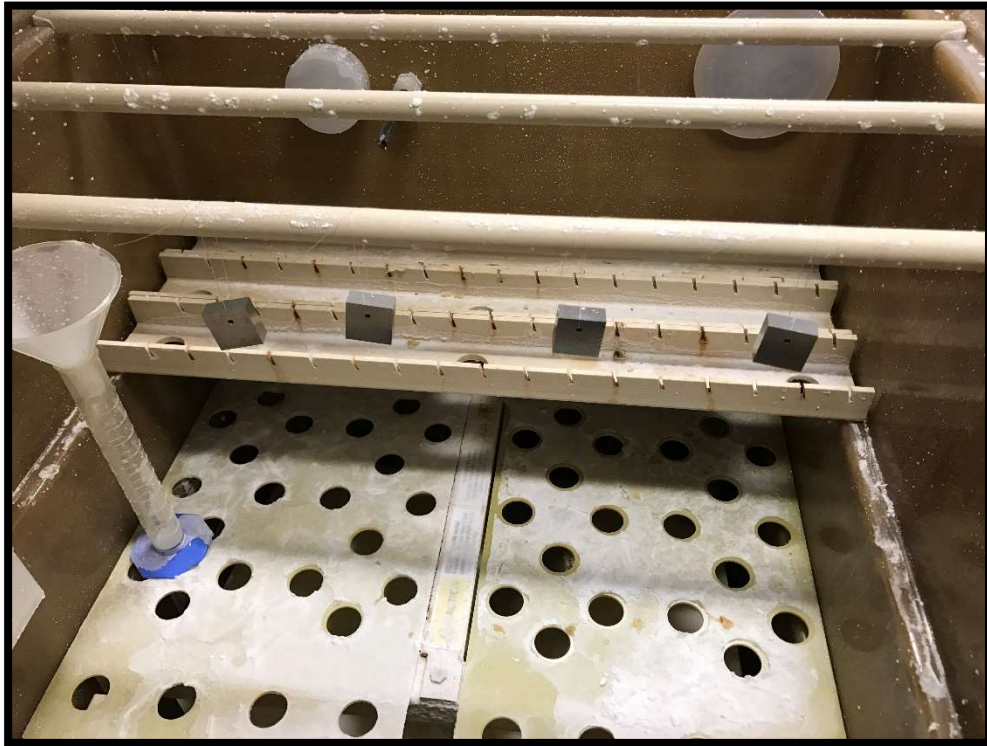


Figure 7b: four suspended samples in the Q Fog corrosion compartment

Step 7: suspend samples from the wooden bars using clear nylon line and ensure that the samples are at least an inch apart



Figure 8: Deionized water dispenser

Step 8: program the Q Fog (described in detail in Part 2 of this tutorial)

Step 9: start the corrosion run

Step 10: using the air pressure control, adjust the spray air pressure to ~15 psi

2. Programming the Q Fog

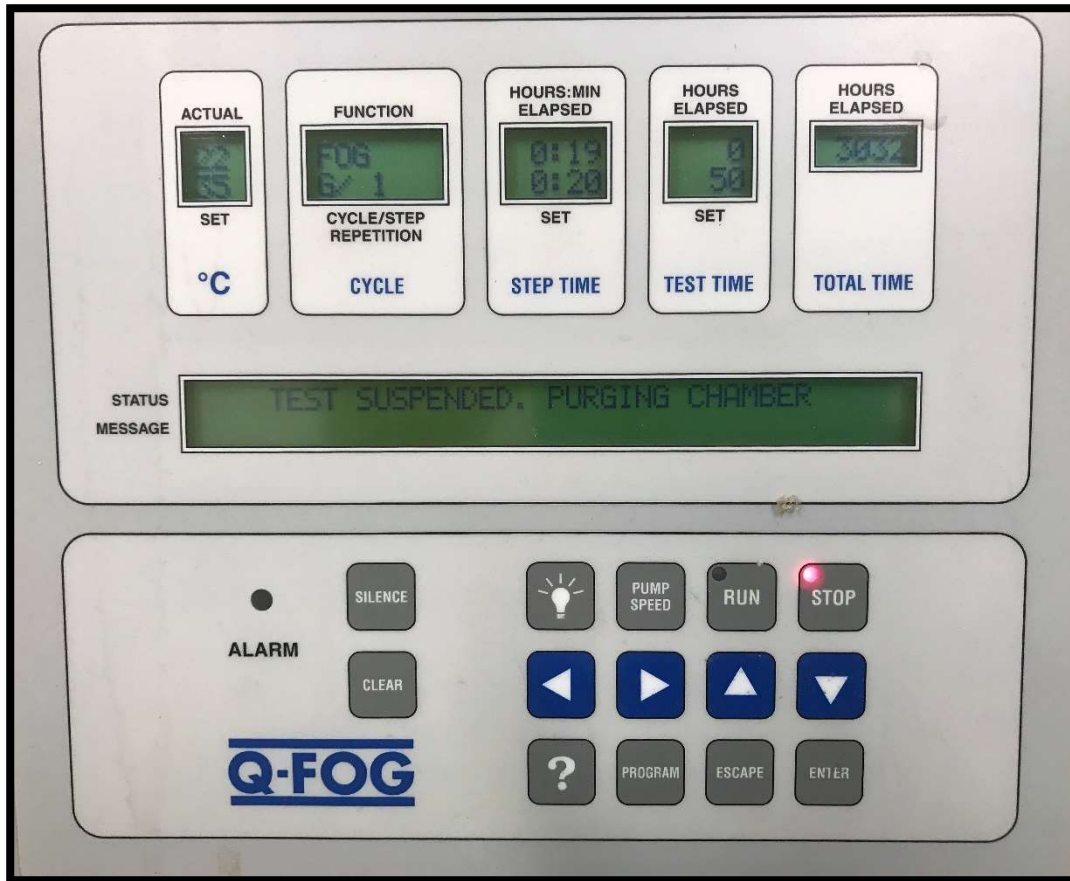


Figure 9: Q Fog programming screen

A. Basic Functions

RUN. Resumes a test exactly where it left off, unless the user has selected a different cycle/step/time in the program mode. When the RUN key is pressed, the selected cycle repeats in an endless loop. The user can select a different cycle or step via the Program Mode. The green LED on the key lights up when in RUN mode.

STOP. Suspends a test at the current elapsed time into a cycle. Runs the Air Purge Blower for 3 hours. The red LED on the key lights up when in STOP mode.

SILENCE. Shuts off the alarm beeper for the current error (but not the alarm message or LED). If there are multiple errors, the alarm may immediately sound again.

CLEAR. Cancel an error message by first keying in "CLEAR." Then press the "ENTER" key to clear the Alarm LED, beeper, and message. There may be multiple messages. Repeat this two-step procedure for each message in the display.

PUMP SPEED. Puts the controller into Pump Speed Setting Mode. Use the up/down arrows to the change pump speed (expressed as a percent of full speed).

PROGRAM. To put the controller into Program Mode, press PROGRAM.

"?" Places the controller into the Diagnostic Mode.

ENTER. Accepts the current selection and moves one level deeper into the program.

ESCAPE. Cancels the current selection and moves back one level in the program.

UP/DOWN ARROWS. Changes the value of the active parameter. The active parameter flashes on display. For example: Cycle A,B,C,D

- A, B, C, D, E, F, G ... (for spelling a name for a cycle)
- Step 1, 2, 3, 4, 5,
- Fog, Dry, Humid, Dwell (for Functions)
- higher and lower digits for temperature or Hrs:Min
- STOP, ALARM, ALARM+STOP, etc. for action at end of Test Time.

LEFT/RIGHT ARROW. Allows user to scroll across the display to select a different parameter to make active. The active parameter flashes. The cursor moves to *each digit* of the name (*pairs* of digits for time and temperature).

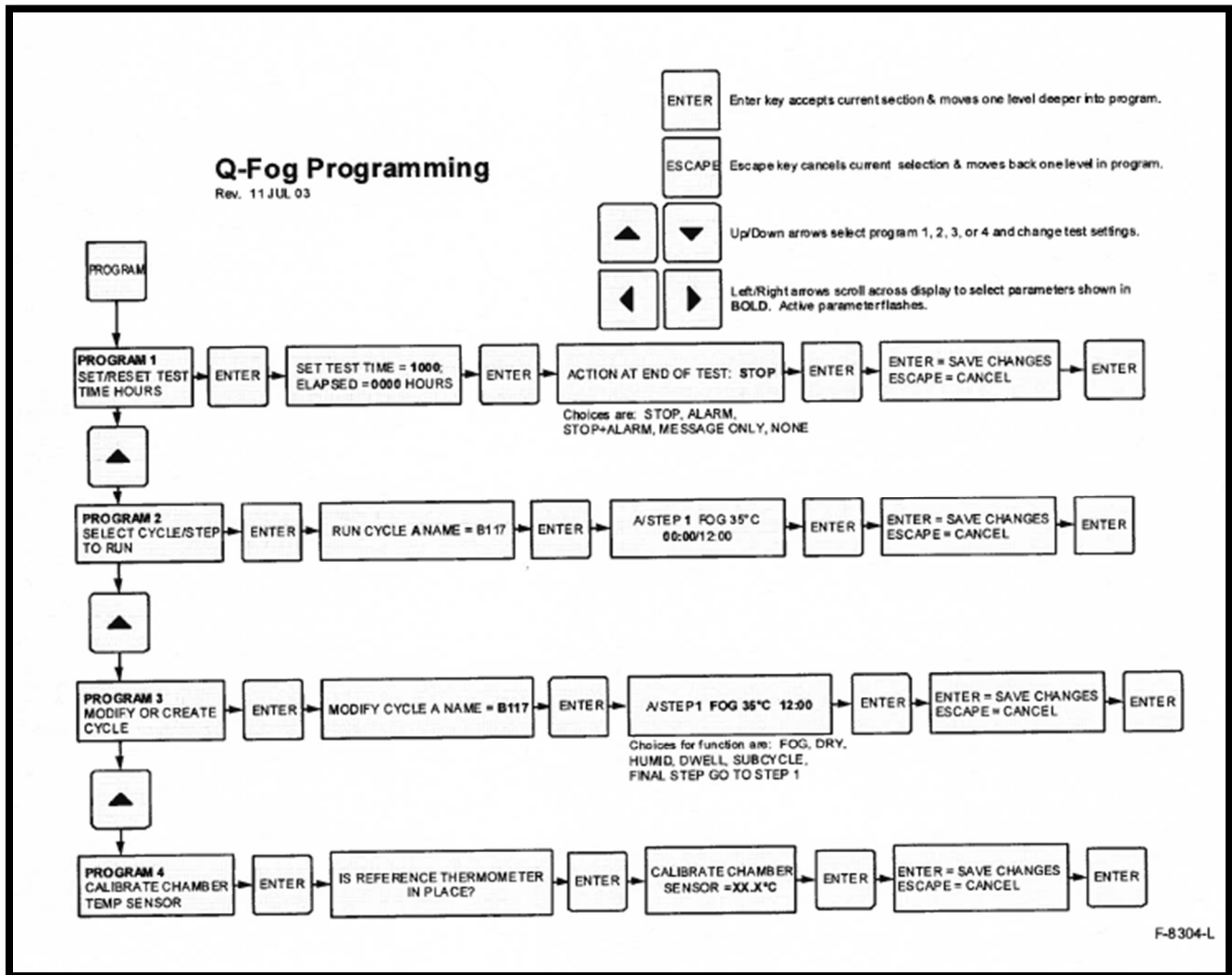
B. General Programming

General. Press the PROGRAM key to enter the Program Mode and then use the up/down arrow keys to select one of four programs. Most users will primarily use only Program 1 and Program 2.

- Program 1 allows you to set the duration of the exposure test in hours.
- Program 2 allows you to choose the cycle to run.
- Program 3 allows you to modify an existing test cycle or to create your own custom cycle. Your Q-Fog will come equipped with several pre-programmed cycles in memory.
- Program 4 allows calibration of the temperature sensor probe.

Press the ENTER key to move one level deeper into a program. Once inside each level, use the arrow keys to move around and to change parameters. Use the ENTER key to move to the next level and to save the changes to any program. Use the ESCAPE key at any time to move back one level or to exit the program.

C. Programming Schematic



D. Program 1

With this program, you set the Test Time (duration). You also program the action at the end of the test (stop tester, sound alarm, etc.). You can also reset the Elapsed Test Hours to zero after a test is finished.

1. Press the PROGRAM key to get into the Program Mode.

1.

2. Press the Up/Down arrows until the display says PROGRAM 1.

2.

3. Press ENTER to move a level deeper into PROGRAM 1.

3.

4. Press the Up/Down and Left/Right arrows to change the Test Time Set, which is the total number of hours you want the test to run. If you want to reset the ELAPSED HOURS, for example to begin a new test, use the Left/Right arrow keys to move over to the ELAPSED HOURS, and the Up/Down arrows to change it.

4.

5. Press the ENTER key to accept your choices and move one level deeper.

5.

6. Use the Up/Down arrow to choose the action the controller should take at the end of the test. Choices for ending actions are: STOP, STOP+ALARM, ALARM, MESSAGE ONLY, or NONE (i.e., no action).

6.

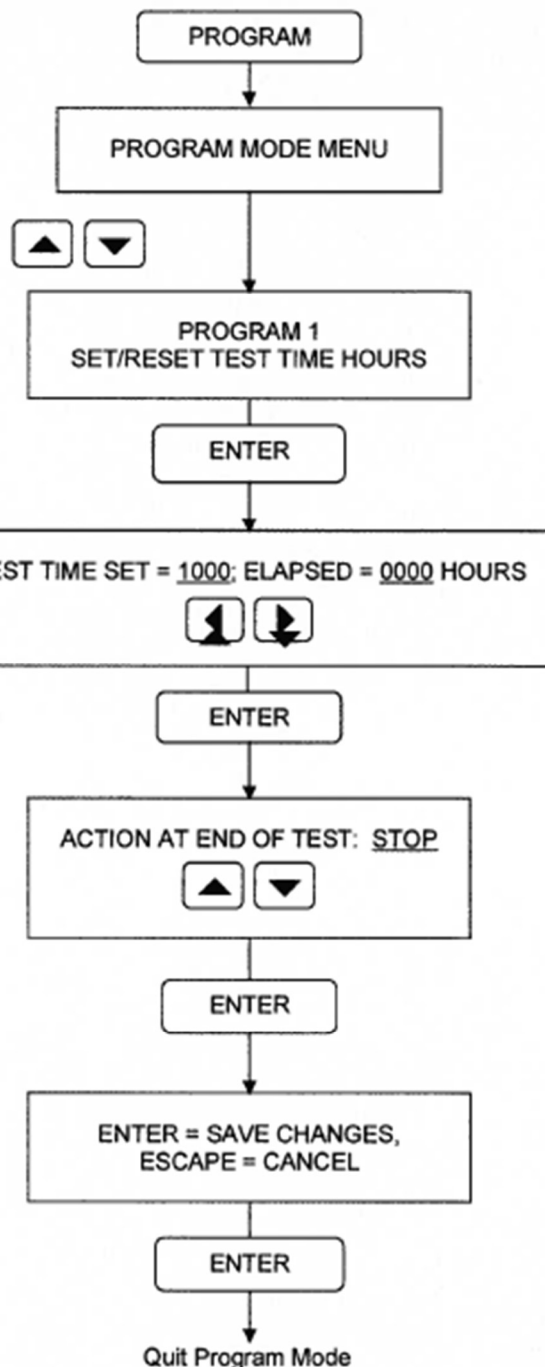
If you choose STOP or STOP+ALARM, the Purge Air Blower starts as soon as the test ends. This dries the samples and stops further corrosion.

7.

7. Press ENTER to accept your choices and move one level deeper.

8.

8. The controller gives you one last chance to change your mind. Press ENTER to save the changes you just made, or press ESCAPE to cancel the changes and move back one level in the program.



E. Program 2

This program allows you to choose the pre-programmed test cycle you want to run. You can also choose to start the tester at a particular step or sub-cycle within the cycle.

1. Press the PROGRAM key to get into the Program Mode.

2. Press the Up/Down arrows until the display says PROGRAM 2.

3. Press ENTER to move a level deeper into PROGRAM 2. Press ESCAPE at any time to cancel your choice and move back one level.

4. Press the Up/Down arrows to select the stored cycle you wish to run.

5. Press the ENTER key to accept your choices and move one level deeper.

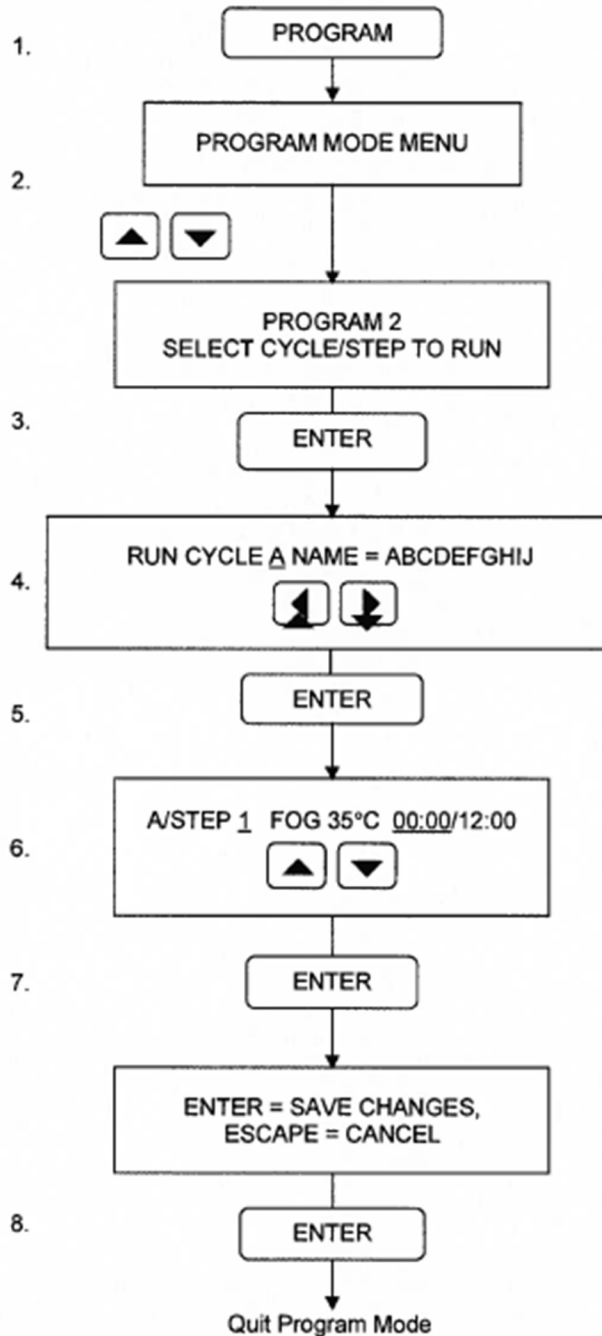
6. If you have chosen a new cycle and want to begin the exposure at the beginning of that cycle, skip to Number 7, below.

If you have selected the cycle you were already running, the display will show where in the cycle the tester was stopped.

If you want to begin at a particular step within any chosen cycle, use the Up/Down arrows to pick the individual step within the cycle.

7. Press ENTER to accept your choices and move one level deeper.

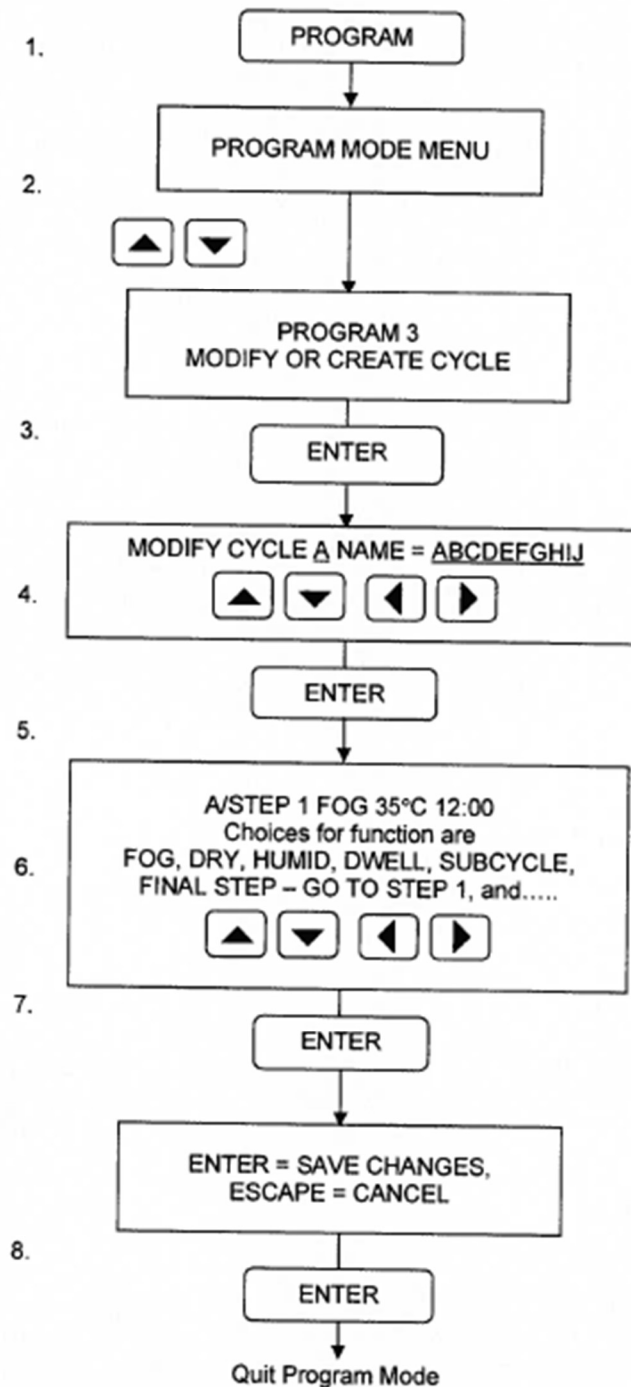
8. The controller gives you one last chance to change your mind. Press ENTER to save the changes you just made, or press ESCAPE to cancel the changes and move back one level in the program.



F. Program 3

This program allows you to modify an existing stored cycle or create a new stored cycle.

1. Press the PROGRAM key to get into the Program Mode.
2. Press the Up/Down arrows until the display says PROGRAM 3.
3. Press ENTER to move a level deeper into PROGRAM 3. Press ESCAPE at any time to cancel your choice and move back one level.
4. Press the Up/Down arrows to select the letter of the stored cycle you wish to modify or create. If you want to change the name, use the Left/Right arrows to scroll to each letter, and then use the Up/Down arrows to select a new letter.
5. Press the ENTER key to accept your choices and move one level deeper.
6. Use Up/Down arrows to choose a step within the cycle to modify. Once you have the correct step, use the Left/Right arrows to scroll across the display until the parameter you want to change starts to flash. Then use Up/down arrows to change the parameter. This example shows Cycle A, Step 1, which is a Fog step, with a temperature setting of 35°C, for 12 hours: 00 minutes. After Step 1 is the way you want it, press Left/Right arrows until the step number flashes, and then use Up/Down arrows to go to another step. See "Program Mode Tips" for creating sub-cycles.
7. After all steps in the cycle are the way you want them, press ENTER to accept your choices and move one level deeper.
8. The controller gives you one last chance to change your mind. Press ENTER to save the changes you just made, or press ESCAPE to cancel the changes and move back one level in the program.



G. Program 4

This program allows you to adjust the calibration of the chamber temperature sensor.

1. Press the PROGRAM key to get into the Program Mode.
2. Press the Up/Down arrows until the display says PROGRAM 4.
3. Press ENTER to move a level deeper into PROGRAM 4. Press ESCAPE at any time to cancel your choice and move back one level.
4. Press the ENTER when the reference thermometer is in place.
5. Use Up/Down arrows to adjust the readout of the Q-Fog's sensor so that it agrees with the calibrated reference thermometer. If the Q-Fog's sensor is more than 3°C out of calibration, replace the sensor.
6. Press ENTER to accept your changes and move one level deeper.
7. The controller gives you one last chance to change your mind. Press ENTER to save the changes you just made, or press ESCAPE to cancel the changes and move back one level in the program.

