

Dual Wire Limit Comparator Operating Instructions

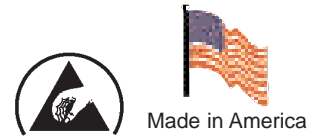


Figure 1. 94320 Dual Wire Limit Comparator

Description

The purpose of the 94320 Dual Wire Limit Comparator is to verify the calibration of the 94319 Dual Operator Programmable Resistive Loop Workstation Monitor by checking four operator conditions: FAIL LOW, PASS (Low Limit), PASS (High Limit), and FAIL HIGH.

There are 10 resistor settings on the Dual Wire Limit Comparator which can be set using the rotary switch. Positions 3 - 8 have installed values. Positions 1, 2, 9 and 10 can be installed by the user for one set each of custom low and high limits (See Page 3). The factory default settings are as follows:

Positions

1. Optional Low Limit FAIL LOW
2. Optional Low Limit PASS
3. 1.91M FAIL LOW
4. 1.91M PASS
5. 10M PASS
6. 10M FAIL HIGH
7. 35M PASS
8. 35M FAIL HIGH
9. Optional High Limit PASS
10. Optional High Limit FAIL HIGH

NOTE: The 94320 Dual Wire Limit Comparator is used to check one OPERATOR at a time.

Packaging

- 1 94320 Dual Wire Limit Comparator
- 1 Calibration Certificate

Operation

- I. Ensure that the 94319 Monitor to be checked is powered and set up as described in its operating instructions.
- II. Connect the plug from the Dual Wire Limit Comparator into the monitor's OPERATOR 1 remote jack (see Figure 1).



Figure 2. Connecting the Limit Comparator to the Operator Remote Jack

III. Turn the rotary knob on the Dual Wire Limit Comparator to "x LOW" (x = 1.91M or the Optional Low Limit FAIL LOW resistance, according to what OPERATOR low limit the monitor is calibrated to). Observe the OPERATOR 1 LED display on the front of the monitor. The yellow LED should be lit, indicating the FAIL LOW condition.

IV. Turn the rotary knob on the Dual Wire Limit Comparator to "x PASS" (x = 1.91M or the Optional Low Limit PASS resistance, according to what OPERATOR low limit the monitor is calibrated to). The green LED on the monitor's OPERATOR 1 display should be lit, indicating the low limit PASS condition.

V. Turn the rotary knob on the Dual Wire Limit Comparator to "x PASS" (x = 10M, 35M or the Optional High Limit PASS resistance, according to what OPERATOR high limit the monitor is calibrated to). The green LED on the monitor's OPERATOR 1 display should be lit, indicating the high limit PASS condition.

VI. Turn the rotary knob on the Dual Wire Limit Comparator to "x HIGH" (x = 10M, 35M or Optional High Limit FAIL HIGH, according to what OPERATOR high limit the monitor is calibrated to). The red LED on the monitor's OPERATOR 1 display should be lit and the audible alarm should sound, indicating the FAIL HIGH condition.

VII. Disconnect the Dual Wire Limit Comparator plug from the monitor's OPERATOR 1 remote jack. Connect the Dual Wire Limit Comparator plug into the monitor's OPERATOR 2 remote jack and repeat steps III - VI to test OPERATOR 2.

VIII. The correct color LED's must light for each step for the 94319 Dual Operator Programmable Resistive Loop Workstation Monitor to completely pass the calibration test.

Installing Optional Low and High Limit Resistance

Use a hex wrench to remove the rotary switch knob. Unscrew the 2 screws on the back of the unit and disassemble the unit.

Two resistances must be installed for each limit: one for PASS and another for FAIL. These two resistances should be ±10% of the calibrating resistance. For example:

| | | |
|-----------------------------------|---|--|
| LOW LIMIT CALIBRATION RESISTANCE | LOW LIMIT FAIL LOW RESISTANCE [1M - (1M × 10%)] | LOW LIMIT PASS RESISTANCE [1M + (1M × 10%)] |
| 1MΩ | 900kΩ | 1.1MΩ |
| HIGH LIMIT CALIBRATION RESISTANCE | HIGH LIMIT PASS RESISTANCE [15MΩ - (15MΩ × 10%)] | HIGH LIMIT FAIL HIGH RESISTANCE [15MΩ + (15MΩ × 10%)] |
| 15MΩ | 13.5MΩ | 16.5MΩ |

The table below specifies which numbered resistances on the circuit board correspond to the optional low limit and the optional high limit. Solder the appropriate resistors in these places.

| Optional Low Limit | Designated Resistors on Circuit Board |
|--------------------|---------------------------------------|
| Low Limit FAIL LOW | R1, R1A (*connected in series) |
| Low Limit PASS | R2, R2A (*connected in series) |

| Optional High Limit | Designated Resistors on Circuit Board |
|----------------------|--|
| High Limit PASS | R9, R9A (*connected in series) |
| High Limit FAIL HIGH | R10, R10A, R10B (*connected in series) |

NOTE: Two (three for position 10) resistor locations are connected in series are provided in case resistors need to be added to achieve the desired total resistance. Solder a shorting wire across the resistor locations that are not used.

Assemble the unit and mark the appropriate places on the label for the optional limits.

It is recommended to turn the rotary switch to the optional positions and measure the resistance from the tip to the body of the plug with an ohmmeter to verify the resistances (See Figure 2).

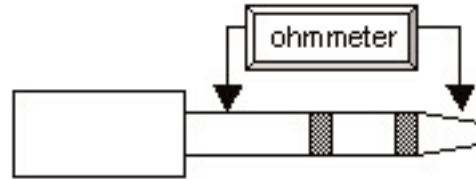


Figure 4. Applying an ohmmeter to the plug

Maintenance

Periodically wipe the plug with alcohol.

Contact and Warranty

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Limited Warranty

SPI expressly warrants that for a period of one (1) year from the date of purchase, SPI Bench Top Ionizers will be free of defects in material (parts) and workmanship (labor). Within the warranty period, the product will be tested, repaired, or replaced at our option, free of charge. Call our Customer Service Department at 909-664-9986 for a Return Material Authorization (RMA) and proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the SPI factory. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, call Customer Service at 909-664-9986 for a Return Material Authorization (RMA) and proper shipping instructions and address. SPI will quote repair charges necessary to bring your unit up to factory standards.

Warranty Exclusions

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