Analytical Components & Systems

Pulsed Discharge Detector Model D-4-I Quick Reference Guide

General Precautions:

- *Never run the detector without discharge gas. To insure a continuous supply of discharge gas, always change the gas bottle when it reaches 500 psi.*
- *Never bake out a column while it is connected to the detector.*
- *Detector lifetime is shortened in the **Ar/Kr PID** mode. To maximize detector lifetime, turn off the discharge power when the GC is not actually analyzing samples.*

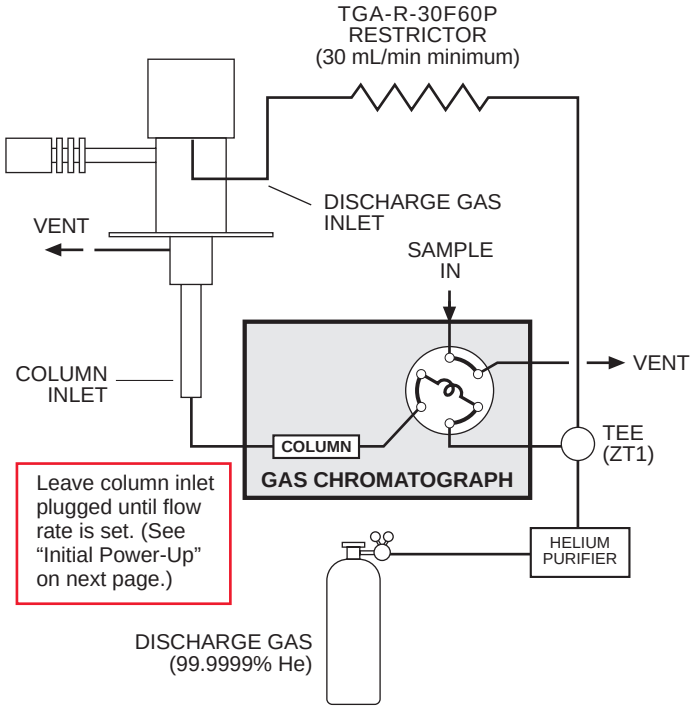
Gas connections

Detector performance is adversely affected by the presence of impurities in the gas stream. To minimize the chance of this occurring:

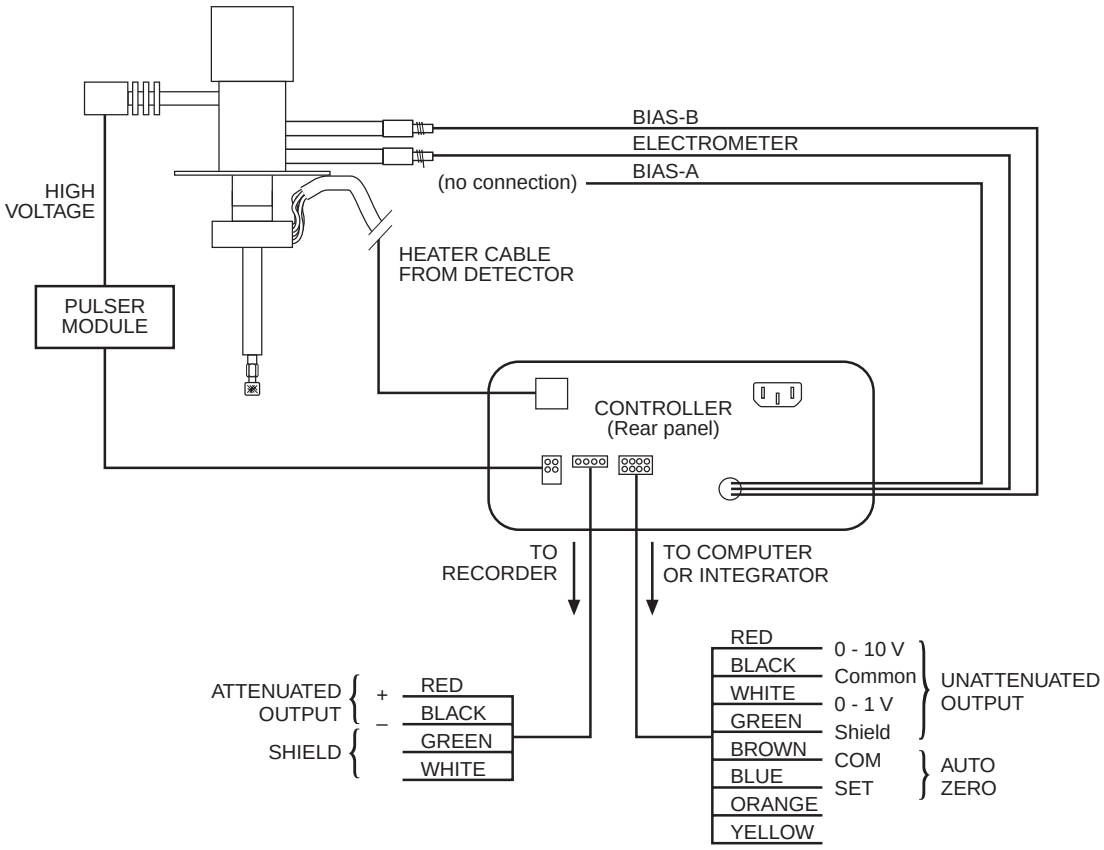
1. Always use the helium purifier.
2. Never use copper or plastic tubes, even before the helium purifier.
3. Never use flow controllers containing polymers or lubricant.
4. Never use pipe fittings or teflon tape downstream of the purifier.

You will need:

- **Helium**
  99.9999% purity (“six nines”)
  Air Liquide part number: ValGas 4
- **Gas regulator**
  Ultrahigh purity, with stainless steel diaphragm
  Valco part number: TGA-422-580
- **Valco Helium Purifier**
  (included with the detector system)
  Valco part number: HP2
- **Stainless steel tubing** and **Fittings with gold ferrules**
  (consult the Valco catalog)
- **Restrictor**
  (included with the detector system)
  Valco part number: TGA-R-30F60P



Electrical Connections



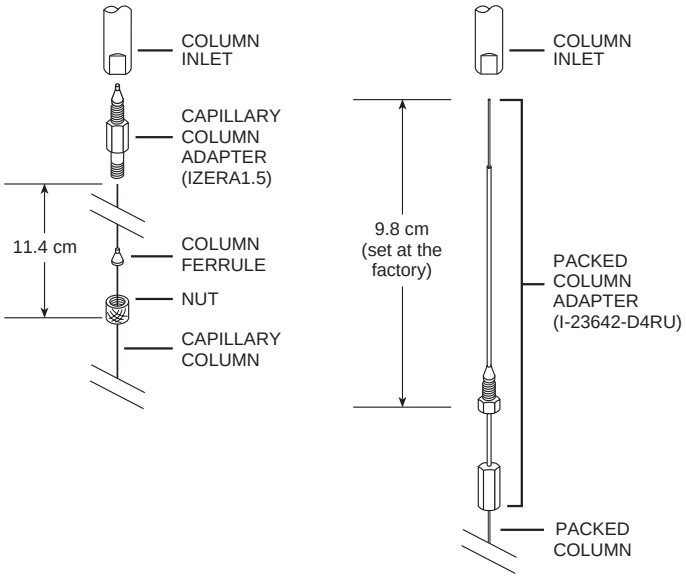
Initial Power-Up

> ***Caution:***
> - *Always make sure that discharge gas is flowing before heating and powering up the detector.*

1. Before installing the column, set the gas flow to 30 ml/min (measured at the detector vent). Let it flow for 15 minutes so that all air is purged from the helium purifier.
2. Plug in the helium purifier.
3. Install the column as illustrated at right.
4. Turn on the MAINS switch on the back of the controller. Set the MODE switch on the front panel of the controller to **PDHID**.
5. Set the detector temperature and allow time for the detector and helium purifier to reach the set temperature.
6. Turn on the DISCHARGE switch on the front panel of the controller.

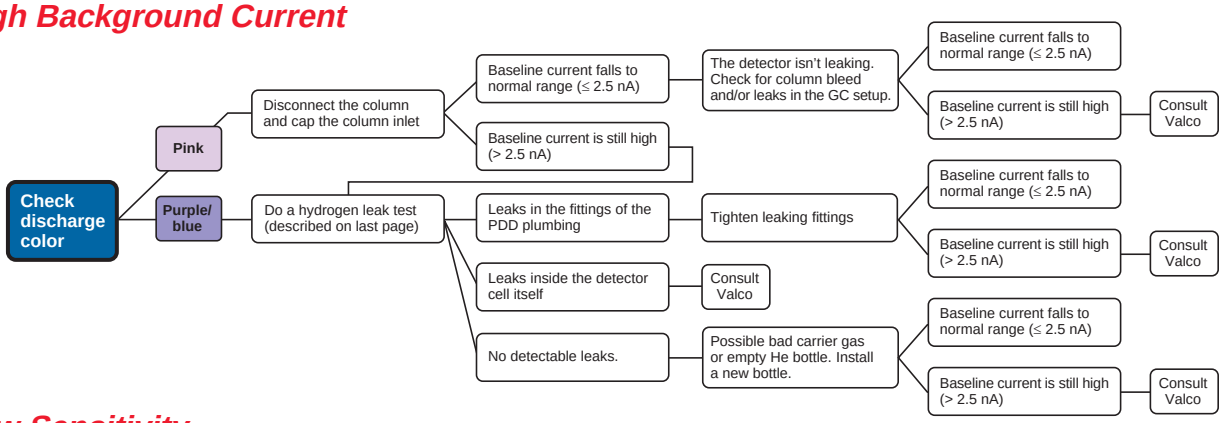
The discharge should start within five minutes. In a clean system, the discharge will have a peach/pink color. A purple discharge indicates leakage or impurities in the system.

7. Check the standing/background current on the controller display. Optimum current is 1.0 - 2.5 nA.

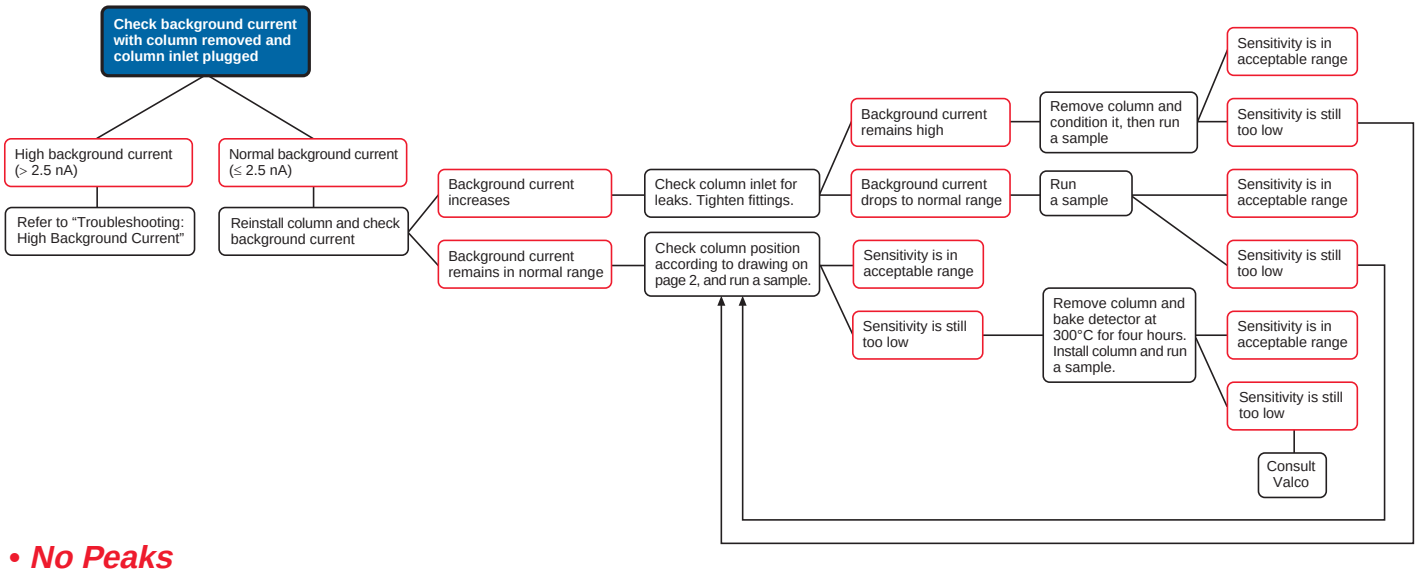


Troubleshooting

• High Background Current



• Low Sensitivity



• No Peaks

If the background current is stable but there are no peaks:

1. Check column flow.
2. Check the column insertion position (11.4 cm for capillary columns, 8.9 cm for packed columns).
3. If there are still no peaks, check to make sure that the GC is actually making an injection.
4. If there are still no peaks, consult Valco.

• High Noise Level

If the noise level is high:

1. See if it improves with the GC fan turned off.
2. Check the column insertion position (11.4 cm for capillary columns, 8.9 cm for packed columns).
3. If the noise level is still high, do a hydrogen leak test (described on the next page).
4. If there are no leaks found, or leaks are found and repaired and the noise is still high, consult Valco.

Hydrogen Leak Test

A hydrogen leak test allows you to pinpoint loose fittings and leaks inside the detector.

1. Connect a length of plastic tubing to a regulated hydrogen bottle. Establish a flow of 5 -10 ml/min.
2. Hold the hydrogen outlet tube at a fitting connection for ten seconds while monitoring the baseline. (Flip the mode switch to PDECD and back to PDHID to un-zero the baseline.)

   If the baseline stays the same, that connection is leak-free. If the baseline goes up, you have located a leak.
3. Tighten the fitting and test it again, repeating as necessary until every connection has passed the ten second test.
4. If the current remains high, hold the hydrogen outlet close to the detector. *(Do not insert the tube into any detector holes.)* If a leak in the detector is indicated, contact Valco.

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