



**01-008C
2 May, 2007**

DANI STARTUP PROCEDURE

I. PURPOSE:

The purpose of this service note is to guide the customer through the start up for the DANI HC analyzer. This service note applies to the model DANI HC analyzer, models 451 and 462.

II. TOOLS:

H₂ generator or bottled H₂ gas
Zero air generator or bottled zero air (HC free)
7/16" wrench
9/16" wrench
Flat tip screwdriver

III. PARTS:

N/A

IV. PROCEDURE:

1. Remove the cover from the analyzer and check to ensure that the cards are seated into the motherboard securely. Do not screw the cover on the instrument yet, but do lay the cover onto the instrument.
2. Plumb your H₂ to the rear of the analyzer to the port marked "h2"

CAUTION: H₂ IS EXTREMELY COMBUSTABLE, ENSURE THAT YOU LEAK CHECK THIS LINE TO THE REAR OF THE INSTRUMENT OR YOU MIGHT HAVE A LEAK THAT CAN CAUSE AN EXPLOSION OR FIRE HAZARD.

3. Plumb your burner air to the rear of the analyzer to the port marked "air".
4. Plumb your source of zero air to the rear of the analyzer to the port marked "zero".

NOTE: SOME OF THE DANI HC ANALYZERS TAKE PRESURIZED ZERO AIR and SOME TAKE ZERO AIR AT AMBIENT PRESSURE. CHECK YOUR MANUAL TO ENSURE THAT YOU ARE PROVIDING YOUR ZERO AIR TO THE REAR OF THE INSTRUMENT AT THE PROPER PRESSURE.

5. Apply power to the instrument and turn the instrument on.
6. If you are using a H₂ generator turn it on. If you are using bottled zero air open the valve on the bottle.
7. Remove the cover from the instrument and turn on the H₂ gas using the switch on the motherboard (s2). The H₂ is on when s2 is in the position that faces the rear of the instrument. When you turn on s2 your pressure for the H₂ should come up to about 1 bar and the led l6 should come on, on the motherboard.
8. Allow your analyzer to run in this configuration for 30 minutes or until the analyzer is up to temp and tries to light the FID. Then put the switch s2 into the off position (towards the front of the analyzer) and leave it in the off position.
9. Turn on the zero air generator. Make sure that the zero air pressure is about 1.0 bar on the gauge in the instrument.

10. Check the pressure gauge for sample and make sure it is about .5 bar.

NOTE: IF YOU ARE USING AN TELEDYNE API M701 ZERO AIR GENERATOR FOR THE BURNER AIR OR THE ZERO AIR SOURCE ALLOW IT TO RUN FOR 3 – 4 HOURS BEFORE YOU BEGIN SAMPLING SO THAT THE HC SCRUBBER CAN COME UP TO TEMP and MAKE VERY GOOD ZERO AIR.

11. When the Dani is up to temperature it will try to light. If the instrument does not light on the first try it will wait a few minutes and then try again. The instrument will try three times and if it still does not light you will get a “flame fail” message. Turn on the h2 switch (s2, on the motherboard) again and allow it to run for 20 minutes.
12. Then turn off the s2 switch and push the reset button and allow the unit to try to light again. The instrument should now light. If it does not light this time reset it again and allow it to try to light a third time. It should light now.
13. If it still does not light then follow the API service note “checking and setting flows in the Dani HC analyzer).
14. Once the instrument lights it is going to go through the preconditioning. If the instrument has been running for at least 2 hours you can skip the preconditioning by pushing the UP and DOWN buttons at the same time. it will now go through the zero calibration. You are going to have to wait for the zero calibration to finish before you go any further. Now the instrument can be calibrated. You have two choices in calibration. You can do a manual calibration or you can do an auto calibration.

NOTE REGARDING ZERO CALIBRATION:

This instrument relies on the zero level being stable and relatively close to zero. If your zero air source is drifting around then you are not going to be able to get good data from this instrument. This is why the analyzer does an automatic zero every three hours.

NOTE REGARDING SPAN GAS SELECTION:

When you are selecting your span gas you have two choices. The first is that you can calibrate the analyzer right out of the bottle or you can calibrate the analyzer through a dilution style calibrator. If you decide that you are going to do your calibrations out of the bottle you are probably going to want to do your calibrations automatically. If you are going to do your calibrations through a dilution calibrator then you are probably going to want to do manual calibrations. This means that you are going to have to use the contact closures on the rear of the instrument to “tell” the instrument when the calibrations are occurring. If you are going to calibrate right out of the bottle, then the balance gas in the bottle must be “air” (not n2). If you are going to calibrate using a dilution style calibrator then you are going to use air as your dilution air and you can have the balance gas in your bottle be n2. If you are taking your calibration gas out of the bottle and you have a balance gas of n2 you are not going to be able to get the instrument calibrated with accuracy. When you are selecting bottle concentrations you are going to want to buy bottles that have ch4 (methane) and c3h8 (propane) with your balance gas of either air or n2. For the rest of this document we are going to assume a range of 10 PPM. If you buy a bottle of gas that has 2.0 PPM ch4 (met) and 2.0 PPM c3h8 (prop), what you are going to get is 2.0 PPM met (methane) and 6.0 PPM NMH (non-methane. When you add them up you come up with a span gas total that is 8.0 PPM. This means that you have 80% of full scale. The reason this is, is that ch4 has 1 carbon molecule. C3h8 has 3 carbon molecules. So if you were to take 1 met carbon molecule and multiply it by 2 you get 2. If you take 3 NMH carbon molecules and multiply them by 2 you get 6. 2 + 6 = 8 total carbon molecules. This is 80% of full scale. This is very important when you are going to select the your calibration gasses. For a more visual idea of what is going on see the table below.

| | | |
|--------------------|--------------------|--------------------|
| 2.0 PPM CH4 (MET) | 1 Carbon X 2.0 PPM | 2 Carbon molecules |
| 2.0 PPM C3H8 (NMH) | 3 Carbon X 2.0 PPM | 6 Carbon molecules |
| | | 8 Carbon molecules |

15. If you are going to do the auto calibration then skip to step 23.

16. To do the manual calibration push the set button and set the range to the range that you are going to use. Now check the rest of the SET parameters and make sure that they are correct per the list below.

Check the following items in the SET menu:

| | | |
|-----------------|------|-----------------------------|
| ST. MET <PPM> | 2.00 | |
| ST.NMH <PPM> | 1.95 | |
| M.R. RATE <MIN> | 06 | |
| CAL. RATE <H> | NO | <u>***IMPORTANT ITEM***</u> |
| MET. AL <PPM> | 9.90 | |
| NMH. AL <PPM> | 9.90 | |
| CAL. LEV. MET | 0000 | |
| CAL. LEV. NMH | 0000 | |
| RANGE <PPM> | 10 | |

17. Input your span gas and allow the instrument to run for 30 minutes. Hook your strip chart recorder to the outputs on the rear of the instrument.

18. Now push the ACT button and record the following information:

| | | | |
|-----|-------------------------|-------|------------------------------------------------|
| act | zero level | _____ | |
| | elect level | _____ | elect level with "m.r." LED lit on front panel |
| | cal level met \approx | _____ | (elect level ("m.r.)) - (zero level) |
| act | elect level | _____ | elect level with "line" LED lit on front panel |
| | cal level nmh \approx | _____ | (elect level ("line")) - (elect level "m.r.") |

19. Now push the SET button and set the CAL. LEV. MET and CAL. LEV. NMH to the values that you have just calculated using the UP and DOWN buttons.
20. Allow the instrument to run for 10 minutes.
21. Look at the MET and NMH conc. on the front panel and see how close they are to the conc. that you are putting into the instrument. If they are not correct then you are going to have to go back into the SET menu and adjust the CAL. LEV. MET and CAL. LEV. NMH up or down to get the conc. on the front panel to read the correct number.

NOTE: WHEN YOU GO INTO THE "SET" MENU TO ADJUST THE CAL. LEV. MET AND CAL. LEV. NMH THE CORRECT LED ON THE FRONT PANEL MUST BE LIT FOR THE VARIABLE THAT YOU ARE CHANGING. THIS INSTRUMENT ONLY CHANGES ONE PARAMETER AT A TIME AND IF YOU ARE NOT ON THE RIGHT CHANNEL FOR THAT PARAMETER YOU ARE GOING TO HAVE TO WAIT UNTIL IT CHANGES TO THAT CHANNEL.

NOTE: WHEN YOU GO INTO THE "SET" MENU TO ADJUST THE CAL. LEV. MET AND CAL. LEV. NMH, KEEP IN MIND THAT IF YOU WANT THE CONC. ON THE FRONT OF THE PANEL TO GO "UP" THEN YOU MUST MAKE THE CAL. LEV. SMALLER. IF YOU WANT THE CONC. ON THE FRONT PANEL TO GO "DOWN" THEN YOU WANT TO MAKE THE CAL. LEV. LARGER.

22. When the conc. on the front of the instrument correct then reset the instrument and allow it to redo the zero level. You don't have to wait for the instrument to do the preconditioning. You can skip the preconditioning by pushing the UP and DOWN buttons at the same time.
23. To do an auto calibration set the CAL. RATE <H> to some interval. This is a calibration that is expressed in hours. Then go into the SET menu and set your calibration points.