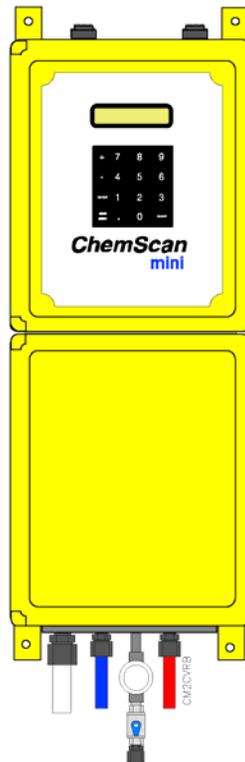


ChemScan[®]

mini UV254 Analyzer Installation, Operation and Maintenance Manual



ASA, Inc.

*Applied Spectrometry Associates, Inc.
2325 Parklawn Drive Suite I
Waukesha WI 53186
PH: 262-717-9500 FAX: 262-717-9530
ASAAalytics.com*

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ChemScan mini UV254 Analyzer

Analyzer Description

The ChemScan UV254 is a photometric analyzer designed to measure light absorbance or light transmittance at a wavelength of 254 nm in liquid samples across a fixed path length in a flow through cell.

Absorbance is a measurement of change in light intensity across the sample.

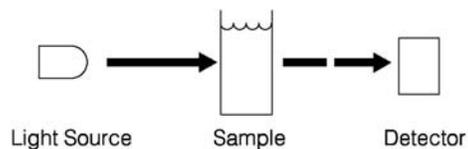
Absorbance measurements at 254 nm can be correlated with measurements of organic matter in the sample, using comparison values from samples that have passed through the analyzer and then have been analyzed in a laboratory to measure the organic content.

Standard measurements of organic content include Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC), Natural Organic Matter (NOM) and Chemical Oxygen Demand (COD). The UV254 analyzer includes the capability to display and communicate raw absorbance values, adjusted absorbance values or calculated organics values for any of the standard organic measurement scales.

Raw absorbance values at 254 nm can also be recalculated and reported as a percent transmittance.

Basic Elements of this Analyzer

- 1.) Light is emitted by a source lamp and directed on a sample.
- 2.) Chemicals which absorb the emitted light at a specific wavelength decrease the amount of light transmitted through the sample.
- 3.) A detector measures the amount of light transmitted through the sample.



ATOPTDG2

Installation and Adjustment

The UV254 Analyzer is supplied with mounting feet as shown in Figure 2.

The analyzer should be mounted securely to an indoor wall or other suitable structure using appropriate fasteners and washers. Indoor installation is recommended because ambient temperature cycles can cause optical instability or freeze the zeroing and cleaning solutions.

A power cord is provided for connection to US standard 120 VAC power. Alternatively, connection to 100 to 240V AC 50/60 cycle, single phase power lines and ground as shown in the Figure 2 input power terminal detail view.

The sample line should be connected as shown in Figure 2. Figure 3 illustrates the required pressurized side stream sample, with a minimum sample pressure of 2 psi and maximum pressures of 20 psi. A pressure regulator should be installed if required to limit the pressure.

Analog output wires are connected as shown on the analyzer's internal label. (See menu to select analog output range.) Analog outputs are in 4-20 mA format.

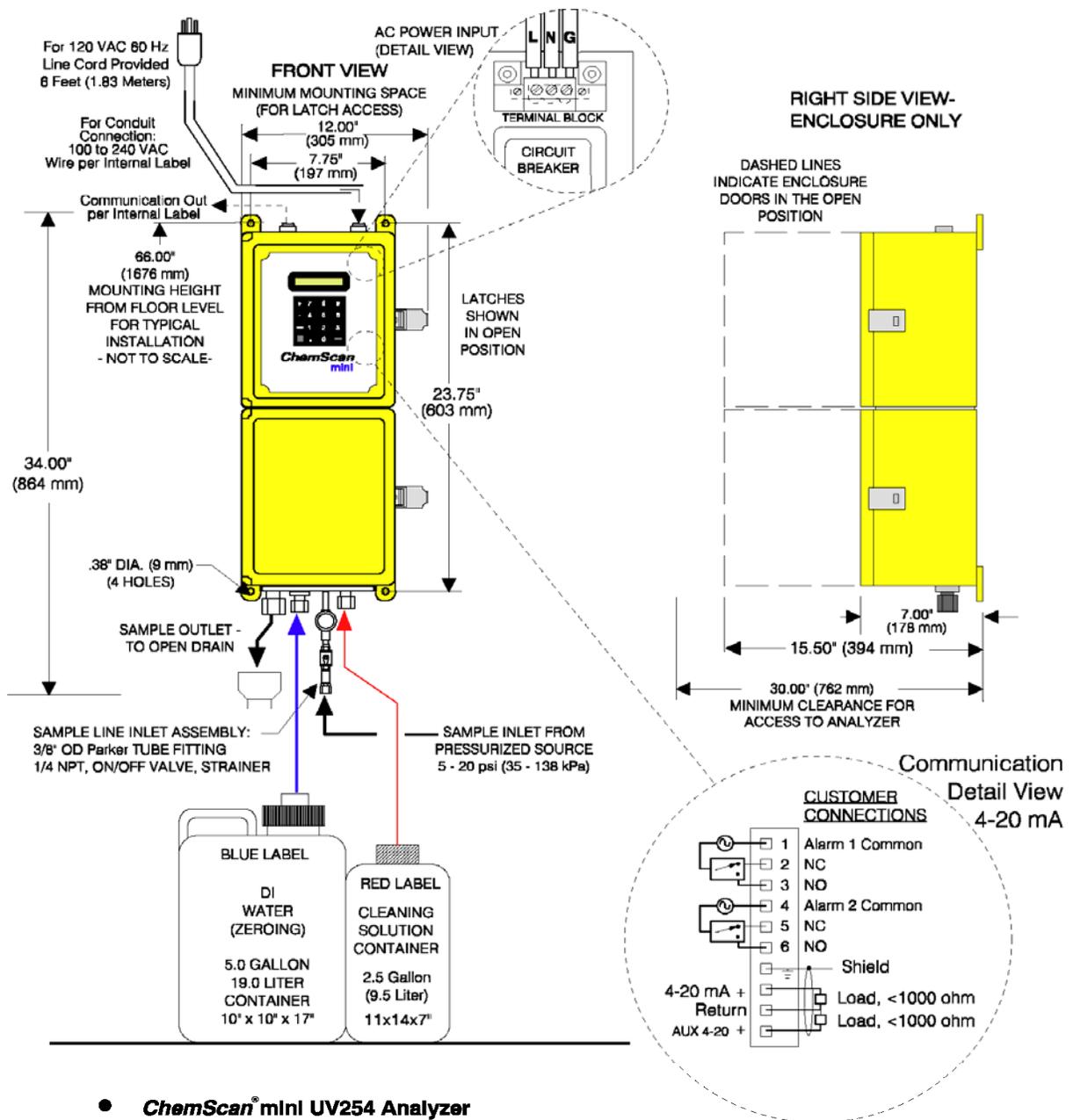
Safety

Only adequately trained, experienced personnel should operate or maintain this analyzer.

This analyzer uses an acidic chemical cleaning solution. Typical chemical handling precautions must be followed. Always wear safety glasses.

NOTE: HARMFUL UV RADIATION IS PRESENT IN THE FLOW CELL WHEN THE INSTRUMENT IS ON! Exposure will cause severe and permanent eye damage!

TURN THE ANALYZER OFF BEFORE REMOVING THE FLOW CELL OR INSPECTING THE OPTICS.

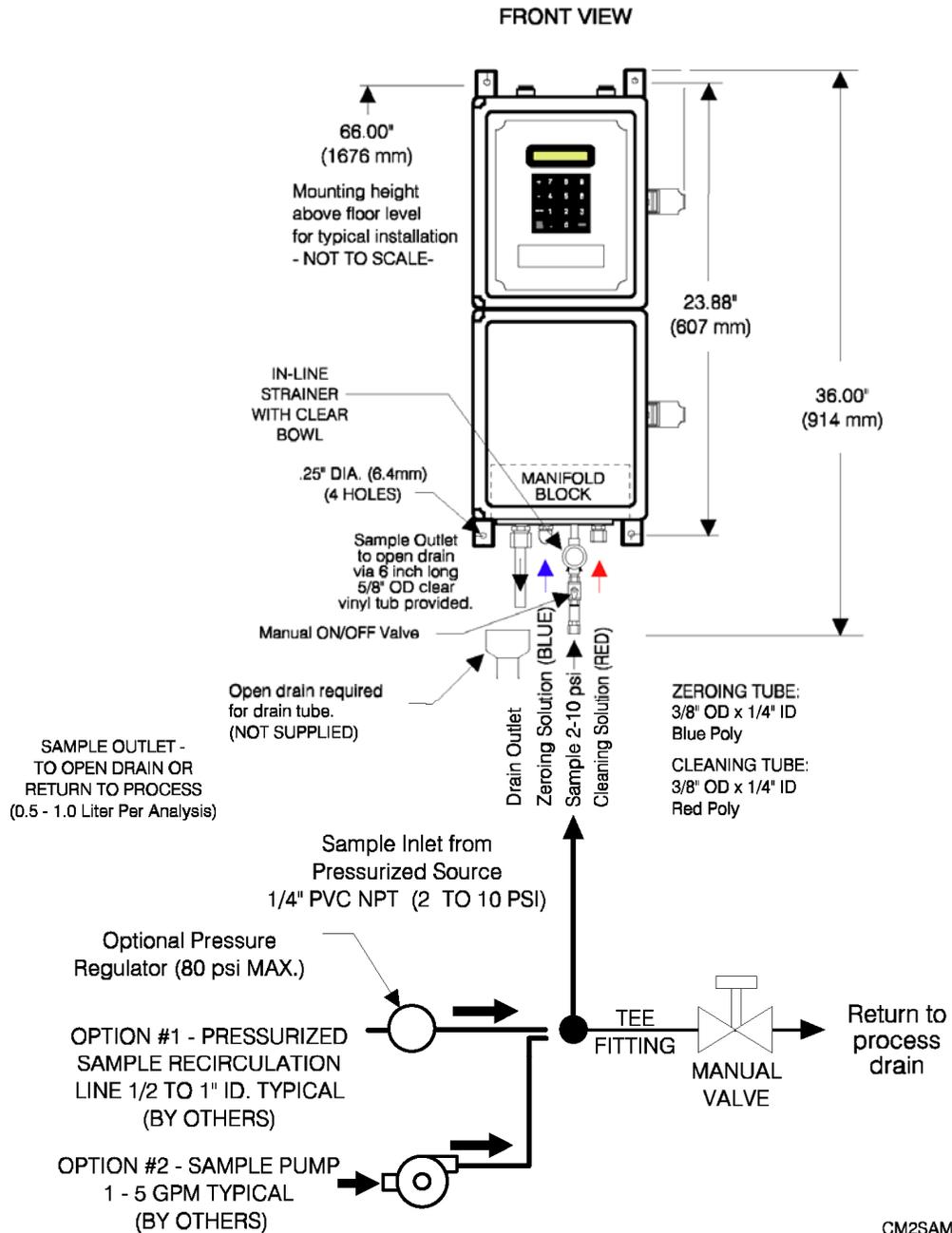


- ChemScan® mini UV254 Analyzer**
 WEIGHT: 27 lbs (12.25 kg)
 DIMENSIONS: 28.0 x 9.50 x 7.0" DEEP, (66 x 24 x 18 cm)
 POWER: 100 - 240 VAC, 50 / 60 Hz, 1 AMP
 NEMA TYPE: 4X Fiberglass Enclosure
 Intended for Installation Indoors

® ChemScan mini UV254 Analyzer
 Installation Diagram/ System Plumbing
 Details with Auto Clean

ASA, Inc.	PHONE: 262-717-9500 FAX: 262-717-9530
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DATE: 6/13/11	
ChemScan mini UV254 Analyzer Installation Diagram	
FILE # CM2INST4	

Figure 2



ChemScan UV254 Analyzer Sample Line Suggestions

Figure 3

Startup Procedure

Verify Fluid Connections

Sample, Cleaning and Zeroing connections must be installed as indicated on the installation drawing. Connections must be firm and vacuum-tight; air drawn into the system will cause erroneous readings.

Power-Up

With proper connection made to 110/240 VAC, turn the analyzer ON by pressing the red power switch located behind the front panel. (Access the switch by loosening the two captive Phillips screws on the right.) The switch should illuminate. Secure the front panel.

The LCD display will display the default sign-on message. At this point the instrument is idle.

PRESS the MAIN MENU button

The display will now present 4 options. These four options are the only selections available to the operator. The installer has access to several more.

The instrument must be allowed to stabilize for at least 20 minutes before zeroing. While waiting, you may familiarize yourself with installation tools.

Initial Zero

In normal operation, the instrument cleans and zeros itself, and displays results based on subsequent light throughput, presented in various units of measure. At installation the analyzer must measure and record the initial, ideal cell readings to use for subsequent diagnostic purposes.

Allow 20 minutes for the instrument to warm up.

1. Turn off the manual sample valve (the blue hand valve) so sample no longer flows through the instrument.
2. Clean the cell by selecting option (3). Select CLEAN. Press (2) for MANUAL cleaning. Press + to turn on the pump, and pump for about 30 seconds. Press - to turn off the pump, and allow the cleaning solution to sit in the cell for about 2 minutes. Then press MAIN MENU to exit this stage.
3. Draw zeroing solution into the cell. Press option (2) ZERO, then (1) MANUAL
4. The display shows the current (NEW) throughput and the previous (OLD) zero's signal levels in volts. NOTE: The new value will vary as it's displayed in real-time. We have not entered this data yet, so disregard these values.
5. Press + to draw in zeroing solution. Draw for about 1 minute, then press - to stop the pump.
6. Observe the NEW value. As air bubbles formed by the pumping of the zeroing solution dissipate the value will stabilize.
7. If the NEW Value is between 1.5 and 4.9 and varying by less than 0.005, the cell is clean and usable.
8. Press ENTER to store the new reference zero. NOTE: The OLD value is now updated to match the new.
9. Press MAIN MENU to exit this procedure.
10. Remember to open the manual ON/OFF valve.

Calibrating to Match Reference Device

% Transmittance is a unit-less measurement ranging from 100% (the sample is absorbing no light) and 0% (the sample is opaque). If the instrument was properly zeroed, then in principle the %T reading should match that delivered by any other device. In fact, however, %T is also affected by the nature of the optical path involved, the size of the absorbing/scattering particles, and other implementation factors. Because it is a straight line from 0 to 100, traditional slope/offset adjustments cannot be done. Rather, the path length in the flow cell should be changed to cause the sample flowing through the UV254 to absorb the exact same amount of light as is being absorbed in the reference device. Since physical adjustment is impractical, the adjustment is performed in software; the transmittance is calculated as absorbance units (logarithmic scale), multiplied by a correction factor, and converted back to % Transmittance.

To calibrate the UV254 ChemScan % Transmittance Analyzer to match the reading from a reference device follow the steps below.

1. Ensure that the ChemScan Analyzer is warmed up for at least 20 minutes and properly zeroed.
2. Put the ChemScan Analyzer "ONLINE" and wait for the reading to stabilize.
3. Take a reading of the same process fluid with the reference device.
4. Press the MAIN MENU key on the ChemScan Analyzer to place it in OFFLINE mode.
5. Press the "7" key. The top line will display the current measurement value. The ChemScan Analyzer will then prompt for the LAB VALUE
6. Enter the value observed on the reference device, and press ENTER.
7. The instrument will calculate a cell correction factor and display it.
8. Press ENTER to accept the new cell correction factor.
9. Press MAIN MENU to exit.

It is advised that adjustments near the extremes of the measurement range – below 15% or above 85% - be avoided, as midrange readings may become distorted.

A similar situation exists for absorbance, where zero AU (Absorbance Units) represents 100% light throughput, and each added AU represents a power-of-ten decrease in throughput. Standard absorbance units are measured using a 10mm cuvette or cell. In fact, for various reasons the UV254 has a 12.5mm cell. The absorbance data is normalized to a 10mm path length by having a normal Cell Factor value of $(10/12.5) = 0.80$. The instrument ships from the factory programmed at 0.80.

Configuration Variables

Hidden option (9) from the main menu screen offers the installer a series of parameters. Use the + and - keys to scroll through the options. The current value is displayed, and a new value may be entered at the cursor. To store a new value, press the ENTER key. Starting from the beginning, these are:

“MAX CLEAN ATTEMPTS”: Number of times the instrument will attempt to clean itself in an autozero/clean cycle before it times out and flashes a warning message.

“MAX ZEROING TIME”: Number of seconds the instrument will wait for a stable reading from the zeroing solution. This is normally set at 120 seconds.

“CLEANING PUMP TIME”: Number of seconds the cleaning solution is pumped during an autozero/clean cycle. Normally set to 30 seconds.

“ZEROING PUMP TIME”: Number of seconds the zeroing solution is pumped during an autozero/clean cycle. Normally set to 60 seconds.

“SAMPLE REFILL TIME”: Number of seconds required to fully turn over the cell with fresh process sample. This time does not include any sample line distance between the instrument and the process. Normally set to 30 seconds.

“CLEAN SOAK TIME”: Number of seconds to let the cleaning solution sit in the cell during an autozero/autoclean cycle. Normally set to 60.

“AutoClean FLUSH TIME”: Number of seconds to flush the cell with process following the clean soak. Normally set to 30 seconds.

“# of DIGITS after DP”: How many digits are displayed after the decimal point. Normally set to 1.

Remember, more displayed digits doesn't mean more accuracy, just more variance and obsessing operators.

“SEND INTERVAL”: Minutes and seconds between reports over the serial channel. Default is 1 minute.

“ON: ZC4 ZERO5 PUMP6...”: Not at all obvious, but useful. Controls the ZeroClean valve, the ZERO valve and the pump. pressing digit 4 (hence ZC4) turns ON the zeroclean valve; pressing digit 1 (ZC1) turns OFF the zeroclean valve. 5 turns On the zero valve, while 2 turns it OFF. 6 turns ON the pump, while 3 turns it OFF. Not listed on the screen, 7 turns on alarm relay one; 8 turns on alarm relay two. CLEAR turns everything off.

“CLEAN IF %T is BELOW”: If the transmittance measured during an autoclean cycle is adequate, we can forgo the cleaning portion, thus saving on solution. This value is the trigger point for that decision, and is normally set at 95. If there is slime buildup on the flowcell windows, it may be wise to set this value up to 97 in order to ensure the cell gets cleaned on every autozero cycle.

“WAIT FOR STABLE HEAD TEMPERATURE”: If yes analyzer will wait for the source LED to be within 0.05 degrees C of optimum before taking readings. Press “.” (decimal point) to toggle.

“SERIAL SETUP MENU” : Set baud rate, parity, enable modbus, set modbus address

“INIT LOG”: Press Clear to clear the internal data log. This may be used if the monitored process had been shut down for a time or the instrument had been idle for an extended period, making the current log information irrelevant. Also displayed is the actual number of used log entries. If desired, the log output can be triggered (to a printer, for example) by pressing the ‘0’ key.

“MAX LOG REPORTS”: Limits the number of reported (via serial channel) logged events to the most recent N, where N is between 1 and 15,000. The maximum 15000 events are always logged, but this option allows limiting the report size to a lower value.

Press “5” to Restore FACTORY DEFAULTS: Restores settings to factory originals. NOTE: Any user settings will be over-written.

“CELL FACTOR”: Observe or modify cell factor (effective path length)

“CODE REVISION DATE”: The date the software was updated.

Menu Structure

The analyzer is equipped with an operator interface consisting of a display and keypad. The operational parameters can be adjusted through the operator interface. NOTE: Whenever a “+” is displayed in the lower right of the display, use the + key to display more menu choices. A complete menu structure table can be found at the end of this section.

The keypad is used to enter numerical values and to select menu choices for the analyzer. There are four main menu paths:

- 1) ONLINE
- 2) ZERO
- 3) CLEAN
- 4) SETUP

NOTE: Data from the analyzer is frequently used by process control algorithms. Spurious responses to calibration, test, or monitoring activities could severely disrupt these control loops. For this reason, the analyzer outputs remain frozen at the most recent ONLINE data in all but the force-output modes when the analyzer is taken offline.

ONLINE selection

The ONLINE menu selection puts the instrument in the ON-LINE mode. The flowing sample is continuously analyzed, and the result is displayed on the front panel. Simultaneously the same data is presented on the 4-20mA-output channel and sent over the serial port. Pressing the MAIN MENU key will return to the MAIN MENU; if a security code is set, the operator will be prompted to enter that before the instrument will leave the ONLINE mode. Upon leaving the ONLINE mode, the 4-20 outputs will be frozen at the last measured value and the serial output will stop updating.

ZERO menu

Pressing 2 opens a menu, which offers the option of manual zeroing or triggering the automatic clean/zero cycle. Pressing the MAIN MENU key will return to the MAIN MENU.

CLEAN menu

Opens another menu layer wherein the cleaning and zeroing solutions can be manually drawn into the instrument. Select either, then press + to start the flow and – to stop the flow. Pressing the MAIN MENU key will return to the MAIN MENU.

SETUP menu

Provides for configuration of the analyzer and the various output channels.

MENU STRUCTURE

MAIN

- 1) **ONLINE** CONTINUOUS MONITORING
- 2) **ZERO** -outputs are frozen at last online reading
display reflects current analysis
 - 1) **ZERO**
 - 1) **AUTO** -triggers the automatic zeroing cycle.
 - 2) **MANUAL** -press + to start flow of zeroing solution,
press – to stop. ENTER to read zero.
- 3) **CLEAN** -outputs are frozen at last online reading
 - 1) **AUTO**
 - 2) **MANUAL**
- 4) **SETUP** -configure analyzer
 - 1) **AUTOZERO**
 - 1) **TIME**-sets Time of Day when analyzer autozeros
 - 2) **INTERVAL** -sets PERIOD of time between autozeros
 - 2) **PARAMETER SELECT**
 - 1) **254 ABS**
 - 2) **%T 254**
 - 3) **SET CLOCK**
 - 4) **4-20mA OUTPUT**
 - 1) **4mA point** -sets the concentration at 4mA
 - 2) **20mA point** -sets the concentration at 20mA
 - 3) **FORCE** -forces the output to an entered current - Select Channel “1” then enter the desired value
 - 5) **ALARM**
 - 1) **SETPOINT** -sets the trigger point for alarm relay
- alarm when ABOVE or BELOW setpoint.
 - 6) **SECURITY CODE** -sets the security password, if active.
 - 7) **LOGS**
 - 1. **INTERVAL MINsec** -- log based time
LOG INTERVAL: 10:00 [current tin minutes, seconds]
NEW INTERVAL: [enter new value]
press CLEAR to start over
press ENTER to save value; logging will be based on INTERVAL.
Press MAIN MENU to exit
 - 2. **CHANGE OF READING** – log based on a step in the reading
LOG STEP: 0.1 [current; a change of 0.1% will trigger log]
NEW STEP: [enter new value]
press CLEAR to start over
press ENTER to save value; logging will be based on change
press MAIN MENU to exit
 - 8) **RESPONSE TIME** -- seconds to average readings
RESPONS SECS: 7 [current; enter a value between 1 and 60]
press enter to save value
press MAIN MENU to exit

Analyzer Maintenance

The analyzer has been design to minimize the total amount of maintenance time. Typically the analyzer requires less than 2 hours of maintenance per month.

Maintenance Schedule

Routine maintenance of the UV254 series analyzer is limited to a few periodic procedures as follows:

Daily

- Observe operation looking for abnormal operation

Weekly

- Fill Zeroing and Cleaning solution containers.
- Inspect and clean Inlet Strainer

Monthly

- Perform Manual Zero Operation and Log Indicator Numbers

Quarterly (or as needed)

- Perform a Calibration Verification and Adjustment

Maintenance Procedures

The following pages are procedures describing the routine maintenance operations.

Interrupting On-Line Operation

To interrupt on-line operation the “Main Menu” key is pressed. If a security code is programmed, the following message will appear:

ENTER SECURITY CODE

Enter the security code followed by the ENTER key. The display will return to the Main Menu. If an invalid security code is entered or if the entry of the code takes longer than 30 seconds, the following message will be displayed for 5 seconds:

INVALID SECURITY CODE

The instrument will then return to the on-line mode.

Sample Line Screens

The sample line inlet is equipped with a small mesh screen to prevent the entry of large particles and debris into the system. This screen must be periodically cleaned or replaced.

To clean the strainers, INTERRUPT on-line mode and close the sample line valve. Unscrew the strainer bowl and remove the screen. If algae is growing on the screen clean it with a bleach solution. Rinse the screen and bowl thoroughly with tap water. Install the screen into the strainer bowl. Be sure the o-ring is installed and screw the bowl onto the housing. Open the sample line valve and look for leaks. After all strainers have been cleaned, return the analyzer to the on-line mode.

Solution Replacement

Zeroing Solution

The analyzer will automatically perform a zeroing operation at a preset interval. The zeroing solution is typically deionized or distilled water. The zeroing solution must contain no nitrate, nitrite, iron or organics. A 20-liter zeroing solution container is provided with the analyzer.

Cleaning Solution

While the analyzer is performing an autozero, it will test the need for cleaning the flow cell. The typical cleaning solution is 1 liter of Muriatic acid (HCl) into 9 liters of DI water. A 10-liter cleaning solution container is provided with the analyzer.

Manual Instrument Zeroing Procedure

The ChemScan UV254 Analyzer must be zeroed occasionally to correct for drift and flow cell fouling. The analyzer will automatically perform a zero on a regular basis (as set in the SETUP menu). However it is important to periodically perform a Manual Zero Operation to track the indicator numbers. This procedure simply involves rinsing the flow cell with deionized water, initiating a zero reading and testing the zero.

Items Required:

1 gallon of deionized water

Interrupt on-line mode:

Press the Main Menu key on the keypad. If a security code is programmed, the following message will appear:

ENTER SECURITY CODE

Enter the current security code followed by the ENTER key and the Main Menu will be displayed:

1) ONLINE 3) CLEAN
2) SAMPLE 4) SETUP

Instrument Zeroing:

Press 2 for ZERO. The following message will be displayed:

1) MANUAL
2) AUTO

Selection of 2) AUTO will cause the system to immediately initiate an auto zero cycle. The instrument will automatically flush with DI water, take a reading, compare the values to certain set points, determine if cleaning is necessary, auto clean, re-zero and re-test. For details concerning the autozero cycle, refer to the Selection of 1) MANUAL ZERO will require the operator to manage the zeroing procedure and to interpret the indicator results. This zero once saved, serves as a point of reference for internal diagnostics.

Press 1 for MANUAL ZERO. The following message will be displayed:

NEW: [XXXX] OLD [XXXX]
+ OR -, Zeroing Pump On/Off

Using the + key to begin flushing the deionized water. Allow the water to flush for 2 minutes and press the - key to stop flushing; wait 30 seconds for the water to settle. Press ENTER to take the reading. The instrument will read the deionized water and store the reading as a zero. The new zero value will be displayed on the right left of the top line. The previous zero displayed to the left.

Using the + and - keys to control the pump, allow deionized water to flush for 8-10 seconds.

The Zero Value should be above 0.500. If not, manually clean the flow cell. If the reading varies by more than 0.005, flush again, pause for 10 seconds, and observe again. Continued noisy zero indicates there may be loose material in the flow cell, which must be removed by following the cleaning procedure.

Manual Chemical Cleaning Procedure

The ChemScan UV254 Analyzer uses ultraviolet light to measure chemicals. Over time the windows in the flow cell may foul. The flow cell windows must be cleaned occasionally to insure strong light signal through the sample. This can be accomplished by simply flushing the flow cell and tubes with a mild acid rinsing the cleaning solution out and zeroing the instrument.

Items Needed:

250 ml of 20 percent HCl acid solution
1 gallon of deionized water for zeroing.

Interrupt On-Line Mode:

If the instrument is in the ON-LINE mode, press the Main Menu key on the keypad. If a security code is programmed, the following message will appear:

ENTER SECURITY CODE

Enter the current security code and the instrument will display the MAIN MENU.

Acid Flush:

Note: Cleaning solution can cause permanent damage to eyes, skin and clothing. Take proper precautions while handling. If solution comes in contact, rinse heavily with water.

On the instrument keypad, press 3 for CLEAN. The CLEAN MENU will be displayed:

Press 2 for MANUAL.

Press the + key to begin pumping the cleaning solution. Allow the pump to run for 30 seconds. Press the - key to stop the pump. Allow the cleaning solution to stay in the flow cell and tubes for 2 minutes, THEN PRESS Main Menu to exit.

Instrument Zeroing:

Zero the instrument using the MANUAL INSTRUMENT ZEROING PROCEDURE.

Following the zeroing procedure, note the Zero instability. If greater than 0.005, the flow cell must be disassembled and cleaned.

Returning to On-Line Mode:

From the MAIN MENU, press 1 for ON-LINE.

Mechanical Cleaning Procedure

Occasionally the automatic cleaning of the flow cell will not remove enough of the fouling on the flow cell windows. If the analyzer readings are erratic or the chemical cleaning solution is being consumed more rapidly than normal, perform the MANUAL ZEROING PROCEDURE. If the zero is below the specified range, perform a mechanical cleaning.

Items needed

One #2 Phillips screw driver.

One wide mouth liquid container 50 - 100 ml.

One box of laboratory lens wipes.

One gallon of deionized water for zeroing.

Turn off the manual sample valve.

Flush the Flow Cell:

From the MAIN MENU, press 2 for ZERO.

The ZEROING menu will be displayed:



Press (1) for MANUAL.

Using the + and - keys to control the pump, allow deionized water to flush for 60 seconds. Press the - key to stop the flow. Press the MAIN MENU key to return to the Main Menu.

Turn off the analyzer. NOTE= HARMFUL UV RADIATION IS PRESENT IN THE FLOW CELL WHEN THE INSTRUMENT IS ON! Exposure will cause severe and permanent eye damage!

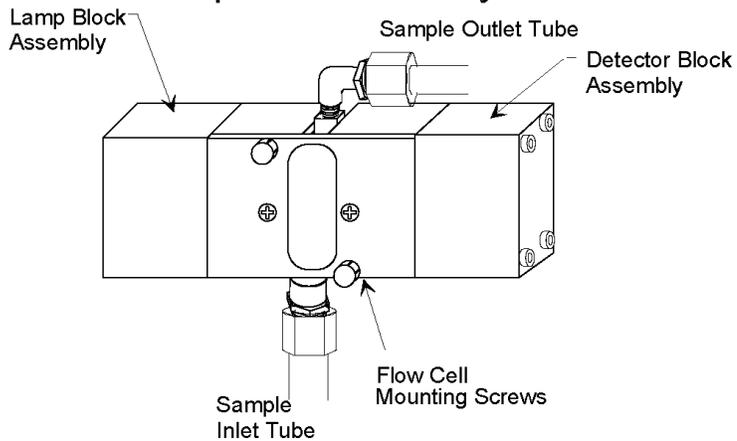
Removing the Flow Cell Assembly

- 1) Hold a small container under the flow cell sample inlet fitting. Loosen the fitting and capture the deionized water into the container. Remove the tubing from the fitting.
- 2) Remove the tubing from the top of the flow cell.
- 3) Remove the two thumbscrews securing the flow cell.
- 4) Carefully remove the flow cell assembly by sliding it out the front of the flow cell mount.

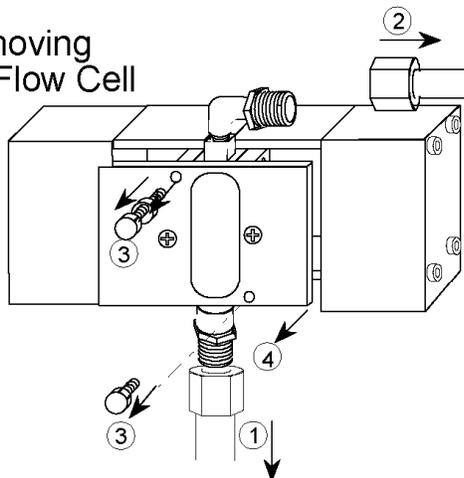
Disassembling and Cleaning the Flow Cell Assembly

- 1) Remove the two Phillips head screws securing the mounting plate.
- 2) Remove the four window plate mounting screws.
- 3) Clean the windows using laboratory lens wipes dipped in water or cleaning solution.
- 4) Wipe the windows and flow cell completely dry.

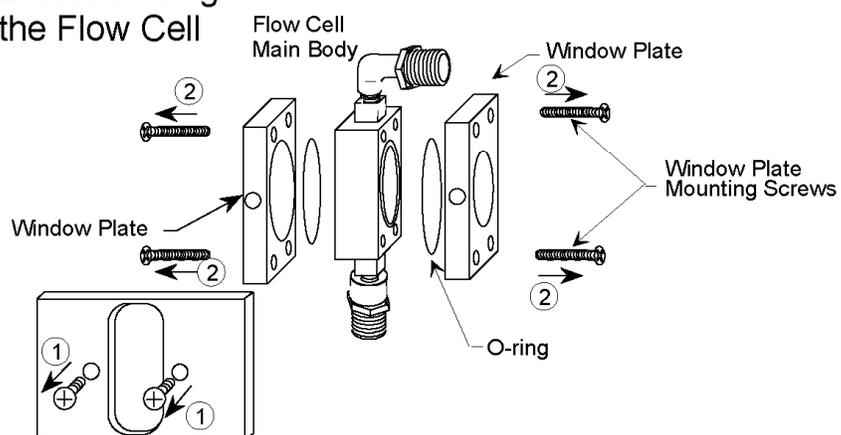
Optrode Assembly



Removing the Flow Cell



Disassembling the Flow Cell



F#FC254B

Figure 5

Assembling and Mounting the Flow Cell Assembly

1) Mount the window plates to the flow cell body with the larger window against the o-rings and the cover plate mounting holes facing the same direction. Be sure the o-ring is installed and fully compressed.

Note: Tighten the four window plate screws in an alternating sequence to evenly compress the o-ring and avoid breakage of the windows.

2) Wipe the outside of the flow cell.

3) Mount the cover plate to the window plates.

4) Carefully slide the flow cell into the flow cell mount and secure using thumbscrews.

5) Attach the fluid tubing and tighten the fittings.

Turn on the instrument. Allow 20 minutes for warm-up.

Testing the Flow Cell Assembly

1) Perform the MANUAL ZEROING PROCEDURE.

Following the zeroing procedure, note the zeroing value. If they are less than 5000, call ChemScan Service for further instructions.

Retrieving Log Data From the Analyzer

The analyzer stores about 15,000 log entries. Log entries are made up of events (going online, going offline, zeroing operations, data readings, etc.), which are time stamped and stored in nonvolatile memory.

Retention time without power applied is approximately 100 years.

Log entries may be read out using the analyzer's serial channel.

Communications settings:

- 9600 baud
- 8 bit data
- 2 stop bits
- No parity
- No handshaking

Procedure for using a computer running a terminal emulator program (HyperTerminal, PCPlus, etc.):

Connect a straight through (no crossover) DB9 - to - DB9 serial cable between the computer and the female DB9 connector located in the center of the analyzer's circuit board (found behind the control panel).

Open a serial channel, with the above settings.

The Following Detailed Description Applies to "HyperTerminal" Found in Most Windows Operating Systems:

Click on "Start", "Programs", "Accessories", "Communication" and "HyperTerminal".

A "Connection Description" dialog box will open. Enter a file name, naming it as you wish, where you wish, on the computer. (For this example "ChemScan" is the file name.) A "ChemScan - HyperTerminal" communication box will open with the file name you specified.

When the "Connect To" dialog box appears select "COM 1" (or other suitable COM channel) under the "Connect Using" heading and select "OK". There is no need to specify "Country/Region, Area Code, or Phone Number" information.

A "Com 1 Properties" box will open. Specify "Port Settings" as indicated above, (Bits Per Second: 9600, Data Bits: 8, Parity: None, Stop Bits: 2, Flow Control: None), then select "OK".

The cursor prompt should appear inside the "ChemScan - HyperTerminal" box.

This concludes the detailed description relevant to the Windows OS HyperTerminal Software.

The following text is also relevant for other terminal emulator programs.

On the computer keyboard, enter the command to initiate download: GETLOG.

The command should echo to the computer's display. If you cannot see what you type, there is a problem with the serial channel or the cable.

After you press the ENTER key, the instrument will send its internal log. When the data transfer is finished, close the file you opened, and terminate the terminal emulator.

15,000 entries is perhaps too much information. You can limit the amount reported to any value you wish.

For example, to receive the last 100 entries, type GETLOG 100.

Perhaps you wish to put the log data into a spreadsheet. In that case, the non-reading events such as power up, cleaning, etc., would need to be removed. To eliminate the need to remove the non-reading events manually you can tell the analyzer to report only readings by typing GETLOG READINGS 500. This will return the last 500 stored readings without operational information.

Or if you want to see what's been happening with the operation, type GETLOG EVENTS 100 to get the last 100 events without any reading data. If you want all the data included, you can type GETLOG ALL 1000 to get all of the last 1000 log entries.

When the internal log reaches the end of its storage space it begins overwriting the earliest data, so there is no need to manually erase the log file. Should you wish to do so, however, use the command RESET LOG.

```
GETLOG [ ALL] [value]
        [READINGS][value]
        [EVENTS][value]
RESET LOG
```

Analyzer Self-Diagnostics and Error Messages

MAINTENANCE REQUIRED message:

The UV0254 Analyzer performs an autozero at predetermined intervals. As the deionized water is measured, the light intensity values are monitored. If the light intensity values fall below the preset value, the system will attempt to chemically clean the flow cell. This process will be repeated up to 3 times. If the intensity values are still too low, the ALL CYCLE FAILED CLEAN CELL MANUALLY message will be flashed on the display. The flow cell will need to be mechanically cleaned to rectify the problem.

Analyzer Troubleshooting Guide

Symptom	Cause	Action
No Flow/ Inadequate Flow	Plugged Strainer or Valve Plugged Line or Valve	Replace Strainer or Open Valve Clear Obstruction or Replace Plugged Items
Unstable Test Zero Readings	Fouled Cell	Chemically Clean Cell
	Bubbles/Air in Flow Cell	Check Plumbing for Air Leaks
Light Levels Too Low After Zeroing	Fouled Cell	Chemically Clean Cell
Light Levels Too Low After Chemically Cleaning Cell	Fouled Cell	Mechanically Clean
Light Levels Too Low After Mechanical Cleaning	Lens Block Windows- Bad Flow Cell	Clean Lens Block Windows Fouled Test Zero Without FlowCell
Readings Constantly at Maximum of Range	Old/Bad Zero Standard Flow Cell Fouled Read Fault	Replace Zero Standard Perform Manual Zero Check for sample line plug
Readings Inaccurate/ Unstable On-Line Readings	Needs Zero Fouled Cell Low Flow Cloudy Sample Bubbles/Air in Flow Cell Needs Calibration	Zero Instrument Clean Cell Clean Out Strainer / Sample Line Install Filters Check Plumbing Calibrate
Analyzer Reads Zero, Does Not Respond	“0” Entered for Flow Cell Factor	From diagnostics menu enter valid cell factor (See page 8)

ADDENDAE:

1. ALARM 2 RELAY: This output has been linked in software to the zero/clean valve. Whenever the analyzer stops the normal sample flow, this relay is activated. This may be used to turn off an external sample pump, keeping it from dead-heading. Or it may be used to provide remote indication that the analyzer is in the zero/clean cycle.
2. AUTOZERO details: Sample flow is stopped. Zeroing solution (DI water) is pumped into the flow cell for the time specified by “ZEROING PUMP TIME”, after which the zeroing solution is allowed to sit for several seconds to outgas. The light level through the flow cell is monitored. If the level is below that set by “CLEAN IF %T is BELOW”, an autoclean cycle is initiated, after which the autozero cycle is re-initiated. The analyzer will repeat the test-clean cycle up to the number of times specified by “MAX CLEAN ATTEMPTS”, after which the automatic cycle is aborted with a warning message. Following successful cleaning (if needed) light through the zeroing solution is monitored until a minimum stability level has been observed for 15 seconds. If stability has not been attained within the period set by “MAX ZEROING TIME” the cycle is aborted. Following attainment of stability, zeroing solution is again pumped for a few seconds; throughput is compared to the level noted when stability was achieved. If there was no change, the zero is considered successful, the values stored, and the process terminated.

Process water is allowed to flow for the time specified in “SAMPLE REFILL TIME” before new readings are taken and the output updated.

Should the zero attempt fail, a failure warning message will be displayed on the LCD, and the previous zero data will be retained. Failure to zero may be due to a badly fouled cell, bad DI water, or a faulty lamp. Once sure that everything is OK, a manual zero should be performed. Data from the manual zero will be used for comparison by subsequent auto zeros. displayed on the LCD, and the previous zero data will be retained. Failure to zero may be due to a badly fouled cell, bad DI water, or a faulty lamp. Once sure that everything is OK, a manual zero should be performed. Data from the manual zero will be used for comparison by subsequent auto zeros.

3. AUTOCLEAN details: Sample flow is stopped. Cleaning solution is pumped into the flow cell for the time specified by “CLEANING PUMP TIME”. The cleaning solution is allowed to sit in the flow cell for the time specified by “CLEAN SOAK TIME”. Cleaning solution is flushed from the flow cell using process water for the time specified in “Auto Clean FLUSH TIME”; process is used to flush in order to minimize consumption of zeroing solution.

Analyzer Error Messages:

MODE: ANALYZER ON-LINE

MESSAGE: []

[ALARM TRIPPED] : Flashing message indicating that the concentration set point has been reached, triggering the alarm relay.

[AZC CYCLE FAILED]

[CLEAN CELL MANUALLY] : Auto Zero, Clean Cycle Failed – Displayed following an unsuccessful AZC Cycle

[AUTOCLEAN FAILED]

[AUTOZERO FAILED] : Flashing error messages, indicating a previous clean/zero failure. Messages remain until system is taken off-line or a successful AZC Cycle concludes.

MODE: ANALYZER OFF-LINE

[UNABLE TO ZERO]

[PLEASE CLEAN CELL] : Manually triggered autozero cycle failed because the cell transmittance is too low compared to the stored reading from when the cell was clean.

[ZERO ATTEMPT FAILED] : Manually triggered autozero cycle failed because the light level was unstable. The system may retry, if it has been programmed by the user to do so. If the error continues, check for good zero solution, air bubbles in the cell and/or tubes, loose particulate in the cell. Make sure the instrument is warmed up and the environment is stable

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* : recommended spare parts

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Applied Spectrometry Associates, Inc.
ChemScan Process Analyzers
2325 Parklawn Drive Suite i
Waukesha, WI 53186
PH: 262-717-9500 FX: 262-717-9530