

Eagle Series

Oil-in-Water Monitor

User Manual

Rev. Sept 26, 2002

Arjay Engineering Ltd.
Oakville (Toronto), Canada, L6H 6C9

Tel. ++1 (905) 829-2418

Fax. ++1 (905) 829-4701

North America 1-800-387-9487



www.arjayeng.com

arjay@arjayeng.com

Take the Tour



Look to Section 3 for a hands on tour of your Eagle

Table of Contents

1	Eagle Function and Description	
	Introduction	3
	Unpacking	3
	Specifications	4
	Important Information	5
2	Fluorometry Principles and Measurement Methods	
	Fluorescence measurement	6
	Filter Disc Method Overview	6
	Extraction Method Overview	7
3	Instrument Functions – A 10-minute Tour	
	Keypad Review	8
	Power-up	8
	Main Keystroke functions	9
4	Eagle Calibration and Use	
	A. Initial Calibration	13
	B. Routine Measurements	17
	Filter Disc Method	17
	Extraction Method	18
	Important Measurement Notes	19
5	Care and Maintenance	
	Cleaning	20
	Optical block disassembly	20
	Optical block assembly	21
6	Troubleshooting	
	Symptoms	22
	Maintenance, Error and other messages	23
	Customer Service and Parts	24

1

Eagle Function and Description

Introduction

The Eagle Series monitor is a filter fluorescence photometer with a fixed excitation bandpass source/filter and an emission bandpass filter. It is designed specifically for the quantitation of low ppm concentration measurements of hydrocarbons (oil) in water.

The Eagle has many applications of use and will provide varying degrees of accuracy depending on it's set up.

- A Filter Disc approach allows field screening for hydrocarbons in water using pre-selected generic calibrations.
- A Solvent Extraction approach will provide an increased degree of accuracy by qualifying and clarifying the sample.
- A site specific calibration will provide more accurate ppm values that target the type of compounds indicative to a specific application.

Remember that this instrument is based on light measurements relative to the calibration determined by the user. Choose the degree of accuracy required and follow the procedures consistently for best results.

Fluorescent emission output is not strictly linear, and it can be affected by numerous variables. If the procedures in this manual are followed closely, accurate concentration measurements can be made with a high degree of reliability.

Unpacking

Unwrap all packages carefully and compare contents with the packing list, making sure all items arrived. If any part is missing, contact your local sales office. Inspect all components for damage that may have occurred while the unit was in transit. If any part appears damaged, contact the carrier immediately. Be sure to keep all packing material for damage claims or for repacking should it become necessary to return the unit.

Specifications

Power input rating	AC Power: 80-250 vac, 47-63 Hz, via supplied transformer DC Power: 12 vdc, 1 amp
Fuse Value	T3.15a, 250v MICROFUSE
Light Source	Mercury lamp (expected life 5000 hr)
Excitation Filter	Model # A00515 - 360 nm Model # A00516 - 254 nm
Emission Filter	Model # A00515 - 460 nm Model # A00516 - 350 nm
Environmental	Indoor Use: 10-50 deg. C, dry area, away from intense light such as sunlight.
Humidity	0-99% non-condensing
Dimensions	330 mm x 178 mm x 182 mm
Shipping Weight:	Approximately (1.2 kg (3.75 pounds))
Product Certifications	
Power Supply Unit: Base Eagle Unit	UL3101-1, CSA C22.2 1010.1, CE entela

This declaration of conformity is valid only for the instrument when it is:

- used in approved locations, and
- used as delivered from Arjay Engineering except for alterations described in the User Manual



Important Information

- Hexane, Pentane, and other solvents and samples can be hazardous.
- Wear gloves when handling.
- Disposal must comply with all applicable regulations.
- Never dispose of by pouring into a drain.
- Always unplug the instrument before removing the bottom panel or cleaning the instrument.
- Use and store the instrument away from direct sunlight and away from areas where the instrument may become wet.
- Allow 15 minutes for warm up each time it is switched on.
- Wipe the cuvet exterior before placing it into the well. Take care not spill any liquid into the ports.
- Reliable results depend on measurement accuracy and consistency. Always use a Dispensing Pipette for solvent measurements.
- The optical surfaces must remain clean in order to measure fluorescence accurately. Periodically clean the optical surfaces as described in the care and maintenance section.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Only accessories and parts approved or supplied by Arjay Engineering may be used for operating, maintaining, and servicing this product.

CAUTION Avoid direct contact with a UV lamp that is powered on. Always power the unit off before servicing or maintaining this instrument.

2 Fluorometry Principles and Measurement Methods

Fluorescence measurement

The fluorescence principle is based on the ability of a compound to be subjected to a specific wavelength of light (excitation) and to re-emit this light energy at one, or more, higher wavelengths (emission). The emission wavelengths are registered as peaks.

Aromatic hydrocarbons, when subjected to a specific wavelength, will fluoresce at a predictable wavelength that is selective to these compounds. Once the cuvet or filter disc is placed into the instrument, the sample is exposed to filtered UV light from a mercury lamp. This light excites the hydrocarbons, causing light to be emitted back at various higher wavelengths. An emission filter in front of the photodetector allows only fluorescence wavelengths indicative of hydrocarbons to register. Thus, the measured fluorescence is a direct indicator of the hydrocarbon concentration. The aromatic hydrocarbon concentration is then used as a proportional indicator of total hydrocarbons, which is displayed in ppm.

Fluorometers measure fluorescence in relative rather than absolute units. After zeroing with a "blank" (clean filter disc, hexane, pentane or other extraction agent), always initiate the monitor by calibrating the instrument to display the known concentration of a solution or standard.

Filter Disc Method

This method is used for field screening as a low cost, solvent-free, fast and effective approach to determine the presence of hydrocarbons in a sample. A water sample is syringed through a special filter paper disc. The disc attracts oil molecules out of the water which concentrates the hydrocarbons evenly across the filter surface.

The emitted intensity of light at a determined filtered wavelength is proportional to the concentration of hydrocarbons on the disc. This intensity is correlated to a ppm value through the unit calibration.

Since many oil types and other fluorescing contaminants may accumulate on the filter surface during the syringe process, the resulting reading should be used as an indicator of the presence of hydrocarbons only.

Extraction Method

To provide the instrument with a stable conditioned sample for more accurate readings, the hydrocarbons are first extracted from the water sample. One such technique is known as a Solvent Extraction and will typically use N-Hexane, Pentane or other extractive liquid.

Certain solvents attract and bond to hydrocarbons. When hexane, for example, is added to a water sample and shaken vigorously, the hydrocarbon molecules will bond to the solvent molecules. When left to stand, the hexane then separates from the water to the surface and will bring the hydrocarbons with it. The upper hexane sample layer contains the extractable hydrocarbons and is tested in the instrument. Since the unit was originally zeroed using hexane, any fluorescence is a direct result of the hydrocarbons contained within it.

This approach to hydrocarbon extraction is confirmed in EPA Method 1664 (Rev. A) and indicated in ISO procedures.

A typical extraction procedure is as follows:

1. Take a 100 ml water sample. A jar with etched with markings is provided.
2. Add 10 ml of solvent using the bottle dispenser provided for consistent measurements.
3. Shake vigorously for 2 minutes. Use a timer or electric shaker for consistent extractions.
4. Allow the sample to stand for 2 minutes. The solvent will rise to the surface.
5. Use a disposable pipet and remove some solvent sample from the middle of the solvent surface layer.
6. Insert the extracted sample into the measuring cuvet to about $\frac{3}{4}$ full. Wipe the cuvet of any fingerprints or grease.

To comply with EPA Method 1664 Rev.A, and where solubles are desired to be measured: if the pH is suspected above 2, add about 1 ml of HCL to the 10 ml water sample and shake to acidify the water prior to the hexane extraction procedure. Discard a portion of the water mixture to return to a volume of 10 ml.

3 Instrument Functions – A 10-minute Tour

Note: This section offers a 10 minute tour to learn the functions of the unit. It is recommended to have the unit and a power source available while you review this section.



Follow any commands beside the magnifying glass to take the tour through your unit.

Keypad review

The keypad is used to select the initial setup options and to zero and calibrate the instrument. The following keys are available for use.

Numeric Keys 0-9 Use the numeric keypad to enter a calibration standard value or to choose menu options.

The **<DISPLAY>** key exits any menu to return directly to the ppm display. While entering numeric values, the **<DISPLAY>** key will back up an entry to allow a correction.

The **<CALIB>** key manually calibrates the instrument or allows post calibration samples to be manually re-entered after a blind calibration has been done.

The **<CONTROL>** key is used to set the ppm range of the 4-20 mA output and relays. These outputs are available as special order.

The **<SETUP>** key accesses the user selected functions including display units, Lamp sleep mode, language of the display, sample averaging, and mA trim

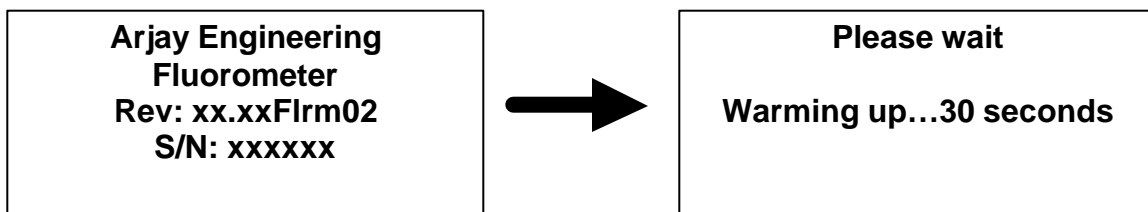
The **<ENTER>** key registers numeric values or advances to the next screen

The **< . >** key represents a decimal point for numeric entries.

Power up



Plug in the power supply to an AC source. **Plug in** the DC jack into the back of the Eagle unit to initiate power. A screen will momentarily flash with the Hardware and Software version. A countdown will begin to allow the lamp to warm up and stabilize.



When complete the display will read :

MEASUREMENT METHOD
Please select method

1 - Extraction cuvet
2 - Filter Disc

This selection determines which port will be used by the operator for the measurement of samples at the site. The user can change ports in the field but will be required to indicate this change to the unit through the CALIB menu. This is required to initiate the appropriate calibration and lamp defaults. When the Method is first selected or changed, a unit Zero and calibration be prompted. Calibration procedures are reviewed separately in Section 4.

The following describes the menu options within each main keystroke selection.

Main Keystroke <DISPLAY>



Press the DISPLAY key to bring the instrument to the measuring display mode. Since the unit continuously sees a fluorescence response from the sensor, a ppm reading will be indicated whether or not a sample is in place. If at any time the user wishes to exit from another menu, pressing the DISPLAY will return the instrument to this normal operating display function.

Main Keystroke <CALIB> (calibrate)



Press the CALIB key

Automatic calibration is normally menu prompted after the unit is powered up, however, the user can manually view or change calibration parameters in this menu. Also, if the measurement method is changed during routine use, the user will press Calib and then 4 to change the Method.

NEW CALIBRATION

1-Auto 2-Manual
3-Slope/Off 4-Method

Enter Selection



Press 1 >Auto Cal This option prompts the user to place a ZERO blank in the unit and then press ENTER to have unit accept the fluorescence value as the zero (offset). The display will then prompt the user to insert a second sample and enter its' ppm value. This will then determine the slope value for the calibration. The mV value in the upper right is the fluorescence signal coming from the sensor that will be used to correlate to the entered ppm values.

ZERO	45mV
Place Cuvet with clean solvent into holder then ENTER	



Press the CALIB key to return to the menu.

Press 2 > Manual Cal This display allows the user to view or change actual fluorescence values (in millivolts - mV) and the a corresponding ppm value. This is used to enter a unique calibration slope without an actual sample. If an automatic calibration was done with a random ppm value, the corrected value will be entered here.



Press the CALIB key to return to the menu.

Press 3 > Manual Ref The Reference value is a reading of the direct lamp intensity. As a lamp ages, its' intensity will diminish. This could affect the accuracy of the reading by giving a less intense fluorescence reading than the original calibration value.

As the lamp intensity diminishes, the offset shift is corrected by the reference value and Eagle software.



Press the SETUP key This display offers a menu of diagnostics and user selectable operation settings. These are configured when first receiving the instrument and may be changed at any time.

SETUP	
1-Diags1	2-Diags2
3-Settings	



Press 1 for Diags1 This will display the raw fluorescence and lamp readings that the sensor is receiving. These are real time values. The FLR reading is from the sample sensor and will display between 0 and 5000. The REF value represents the lamp intensity and will be between 400 and 5000. A reading below 400 indicates a weak lamp that should be replaced. A maintenance display message will automatically occur if the lamp reading drops below 400. If the 4-20 mA output option is being used, pressing 1 while in this screen will force a 4mA output signal. Pressing 2 will force a 20 mA signal. This can used to set up and verify remote indicators, loggers, or controls.

DIAGS1	
FLR ON	45 mV
REF ON	800 mV
1- 4 mA	2-20 mA



Press the SETUP key to return to the menu

Press 2>Diags2 This will display the most recent maximum and minimum fluorescence values received by the sensor. This provides an indication of the stability of the sample, lamp and sensor. A stable reading with a sample in place should have a difference of less than 10 mV. A stable reading with the Test Block should have a difference of less than 5 mV.

DIAGNOSTICS 2	
min	43
max	47
difference	4



Press the SETUP key to return to the menu

Press 3> Settings This display offers a menu of user configurable features. These can be changed at any time. Factory defaults have been entered which are typical to many applications.

SETUP	
1-Auto Off	2-Filter
3-Language	4-Units
Rev: Flrmtr02	



Press 1 for Auto Off This will prompt you to enter a time, in seconds, for the lamp to wait without activity before going into sleep mode. This is to conserve the lamp life and allows the unit to be powered up continuously. To turn the lamp on again, any key is pressed. The factory setting is 1800 seconds (30 minutes). Minimum time is 1 minute, maximum time is 24 hours.



Press <Display> key to return to the menu.

Press 2 for Filter This provides some stability to the sample reading by averaging a number of readings and presenting the Eagle with one reading. This filters out jumpy or spiked readings. The Eagle takes 200 readings per second. Filtering is selectable to average 1 to 1000 readings. Factory setting is 250.



Press <Display> key to return to the menu

Press 3 for Language The LCD display may be available in languages other than english. If additional languages have been included in this software, they will be offered on this menu.



Press <Display> key to return to the menu

Press 4 for Units The concentration reading will typically be displayed in ppm. From this menu, the user may also select %, FLR (raw values), or blank. The unit does not convert from one type of units to another after calibration. During calibration, concentration values must be entered using the display units indicated.

4 Eagle Calibration and Use

Users familiar with sample preparation and this instrument can refer to the laminated Quick Reference card for an abbreviated guide to measure the concentration of an unknown sample.

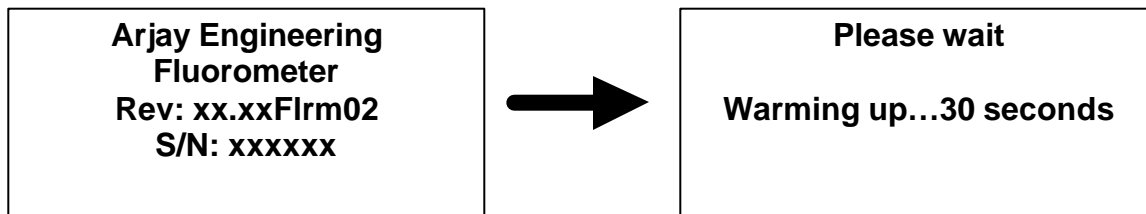
A. Initial Calibration

1. Determine the Sample Approach to be used and if a site specific calibration is to be done. If a site specific calibration is to be done, a prepared known sample will be required or a sample can be sent to lab for analysis immediately following the calibration procedure. For calibration, acquire a sample with a ppm value that provides a suitable range for the instrument. For instance, if typical samples range from 0 to 50 ppm, a calibration standard of 30 ppm to 60 ppm would be appropriate. If samples of 10 ppm are more common, a 10 ppm calibration sample would be more appropriate.

Using an actual contaminated water sample for calibration will provide the most reliable calibration. Prepared sample standards may not be indicative of actual process conditions of oil type, oil dispersion, and background contaminants. Prepared samples may be unstable and retention of oil injected the water can be difficult. If preparing a standard use glass containers only (plastic containers draw oil out of the water). Using a carrying agent, such as acetone, to help disperse the oil into the water prior to the extraction.

2. Routine use and calibration of the instrument:

Power on the instrument. The screen will indicate a lamp warming count down. .



When complete, follow the screen instructions to select the Sample Measurement Method .

MEASUREMENT METHOD
Please select method

1 - Extraction cuvet
2 - Filter Disc

If Extraction Cuvet is selected:

ZERO **45 mV**
Place cuvet with
clean solvent into
holder then ENTER

For the Extraction Method, insert a cuvet containing clean extraction solvent only. Fill the cuvet to above 3/4. Always insert the cuvet such that the clear flat surface is toward the front. Lower the swing arm over the sample. Wait a few seconds to stabilize and then **Press <ENTER>**.

If Filter Disc is selected:

ZERO **45 mV**
Place filter disc
with clean water in
holder then ENTER

For the Filter Disc Method, inject clean water free of hydrocarbons through a fresh filter paper, remove the top filter screen and place the disc with paper into the disc port. Move the swing arm over the sample. Wait a few seconds to stabilize and then **Press <ENTER>**.

2. The Eagle will prompt the calibration source:

SELECT CALIBRAITON
1-Use last cal
2-Select from list
3-Perform new Cal

Select the type of calibration to be used. If the last calibration or a stored calibration is selected, no further calibration samples are required.

Some typical response calibrations have been factory set into the Eagle menu for your use. These are indicated by the suffix “f” after their description. These calibrations are indicative of typical hydrocarbons in clean water. They will not accurately reflect the type of oil and site conditions at your site. They act as a valuable reference and screening tool where a site calibration may not be available.

The user may store a calibration for future use. There is memory space for 6 Filter Disc calibrations and 6 Extraction Cuvet calibrations. These are numbered as 4 to 9 in each menu. Storage location 1 to 3 offers the factory supplied calibrations.

- 3 If **1-Use Last Cal** is selected:

OIL CONCENTRATION
Cuvet Method
Cal: Diesel-f
30 ppm

- 4 If **2-Select from list** is chosen:

CURRENT CAL LIST
Current Cal:
Diesel-f
Press 0-9 the ENTER

The display will indicate the Method chosen, the Last Calibration storage identification, and the present reading at the sensor. The Eagle is ready for sample reading. Refer to Part B of this section.

- 5 If **3-Perform new Cal** is chosen:

NEW CALIBRATION
Save calibration as:
Cal4
Press 4-9 then ENTER

The display will prompt you to enter a Storage Location Number. Select from 4 to 9. **Important: This will override any calibration presently stored in the selected storage location.**

Press **ENTER** to accept the location number.

The display will offer a menu of calibration entry methods.

NEW CALIBRATION	
1-Auto	2-Manual
3-Slope/off	4-Method
Enter Selection	

1-Auto will calibrate the unit based on the user presently having a prepared or unknown contaminated water sample.

2-Manual will allow you to view and change the ppm and mV values that were entered during the Auto calibration mode.

3-Slope/Off will allow to view and change the offset (zero) value of the present calibration and the calculated slope (mV change per ppm)

For a new calibration **Press 1 for Auto.**

5.1 Follow this procedure for the Extraction Method only. For the Filter Disc Method refer to 5.2

Acquire some contaminated water and do an Extraction as follows:

1. Take a 100 ml water sample. A jar with etched with markings is provided.
2. Add 10 ml of extraction solvent using the bottle dispenser provided for consistent measurements.
3. Shake vigorously for 2 minutes. Use a timer or electric shaker for consistent extractions.
4. Allow the sample to stand for 2 minutes. The solvent will rise to the surface.
5. Use a disposable pipet and remove some solvent sample from the middle of the solvent surface layer.
6. Insert the extracted sample into the measuring cuvet to about $\frac{3}{4}$ full. Wipe the cuvet of any fingerprints or grease.

(To comply with EPA Method 1664 Rev.A, and where solubles are desired to be measured: if the pH is suspected above 2, add about 1 ml of HCL to the 10 ml water sample and shake to acidify the water prior to the solvent extraction procedure Discard a portion of the water mixture to prepare for the extraction with 10 ml).

Insert the cuvet into the port and lower the arm. Enter the value of the concentration (in ppm), and press **<ENTER>**. If the ppm value is not known, enter a random ppm value of the expected concentration. Immediately send a water sample acquired at the same time (not extracted) to a local laboratory for analysis.

If you entered a random ppm value: When the actual ppm value is determined, **Press the CALIB key**, then **Press 2** for Manual Calibrate. Press **Enter** to accept the First Point 0 ppm. Press **Enter** to accept the First Point mV reading. Key in the corrected ppm value for the Second Point. Press **Enter**. Press **Enter** again to accept the Second Point mV reading. Press the **Display Key**. Calibration is complete

5.2 Following this procedure for the Filter Disc Method only. For the extraction Method refer to 5.1.

Place a clean filter paper into the filter holder and twist the assembly onto the syringe.

Fill the syringe to with 500 ml of contaminated water. Slowly expel the sample through paper (about 5 seconds to complete). This expelled water may discarded.

Remove the filter assembly from the syringe, unscrew the top portion plastic ring and carefully remove the plastic screen disc. Leave the filter paper exposed on the filter base.

Place the filter base with exposed paper into the Disc Port. Raise the swing arm over the sample.

Enter the value of the concentration (in ppm), and press **<ENTER>**. If the ppm value is not known, enter a random ppm value of the expected concentration. Immediately send a water sample acquired at the same time (not extracted) to a local laboratory for analysis.

If you entered a random ppm value: When the actual ppm value is determined, **Press the CALIB key**, then **Press 2** for Manual Calibrate. Press **Enter** to accept the First Point 0 ppm. Press **Enter** to accept the First Point mV reading. Key in the corrected ppm value for the Second Point. Press **Enter**. Press **Enter** again to accept the Second Point mV reading. Press the **Display Key**. Calibration is complete

4. You may now determine the value of the Test Block for the above calibration. This will allow frequent re-calibrations and checks without having to use prepared samples. Insert the supplied Test Block in the port. Always direct the divot mark towards the front. Lower the arm and record the reading for future daily calibrations. This value is specific to this calibration and site only. It is not indicative of other hydrocarbon contaminants and sites.

Leave the instrument powered on at all times if the unit is to be used frequently. Site conditions and oil make-up can change over time at any one site. Periodic re-calibrations using actual prepared or analyzed samples should be done.

When leaving the instrument on for extended periods, the Lamp Sleep Mode will put the lamp into standby if not used within the time allotment selected in the SETUP menu.

B. To measure a sample:

Filter Disc Method

Place a clean filter paper into the filter holder and twist the assembly onto the syringe.

Fill the syringe to with 500 ml of water to be tested. Slowly expel the sample through paper (about 5 seconds to complete). This expelled water may be discarded.

Remove the filter assembly from the syringe, unscrew the top portion plastic ring and carefully remove the plastic screen disc. Leave the filter paper exposed on the filter base.

Place the filter base with exposed paper into the Disc Port. Raise the swing arm over the sample.

The ppm reading will read automatically.

Extraction Method

Always wipe the cuvet with a clean tissue to remove and contaminants from handling prior to placement into the port

1. Perform an extraction as follows:

1. Take a 100 ml water sample. A jar with etched with markings is provided.
2. Add 10 ml of solvent using the bottle dispenser provided for consistent measurements.
3. Shake vigorously for 2 minutes. Use a timer or electric shaker for consistent extractions.
4. Allow the sample to stand for 2 minutes. The solvent will rise to the surface.
5. Use a disposable pipet and remove some solvent sample from the middle of the solvent surface layer.
6. Insert the extracted sample into the measuring cuvet to about $\frac{3}{4}$ full. Wipe the cuvet of any fingerprints or grease.

(To comply with EPA Method 1664 Rev.A, and where solubles are desired to be measured: if the pH is suspected above 2, add about 1 ml of HCL to the 10 ml water sample and shake to acidify the water prior to the solvent extraction procedure. Discard a portion of the water mixture to prepare for the extraction with 10 ml).

2. Using the pipet, put some extracted sample into a fresh cuvet to above $\frac{3}{4}$ full and place this into the instrument port. Lower the arm. The sample will read automatically.



Important FluoroCheck measurement notes

- Accurate measurements of water and solvent are critical. Be consistent.
- Consistent shaking for the prescribed time is important to the extraction process.
- Turn the lamp on 15 minutes before use to allow the lamp and sample compartment temperature to stabilize.
- Zero the unit with a Zero Blank of solvent frequently.
- Always orientate the cuvet holder the same way.
- Clean the cuvettes with a low-lint tissue prior to inserting.
- Repeat the measurement of each sample concentration to verify that the results are reproducible.

5

Care and Maintenance

To clean the exterior, wipe the unit with a damp cloth. Never use abrasive cleansers or solvents. The only user-serviceable component is the optical block. The optical block assembly is described in the cleaning section below.

Optical block This contains the lamp, filter cube, and photodetector sensor board. The following procedure is used to replace a lamp and/or clean the instrument.

CAUTION Avoid direct contact with a UV lamp that is powered on. Always power the unit off before servicing or maintaining this instrument.

Important

- Clean the optical block frequently
- Turn the power off and unplug the power cord
- The optical surfaces are easily scratched. Handle with extreme care and polish gently
- Wear gloves when servicing the optical block. This protects both the technician from hazardous materials that may have been spilled and protects the optical surfaces from fingerprints
- Use only isopropanol on a clean soft cloth to clean the optical surfaces.

Optical block disassembly

- 1 Unplug the power cord. Spread a soft cloth over the work area and turn the unit upside down onto the padded surface. Wear gloves, both to protect yourself and the optical surfaces.
- 2 Remove the plastic shroud covering the swing arm by removing the six plastic capped screws. Now remove the lid on the aluminum optical block. (4 screws)

- 3 A circuit board and lamp will be visible. Lift off the circuit board (4 screws). The filter cube can now be lifted out for cleaning.
- 4 **Cleaning.** Clean the optical surfaces well with alcohol wetted cotton swabs. If required, gently polish with a dry soft cloth. Remove all particles. Allow to air dry. All surfaces must be completely clean for accurate measurements.
- 5 **Lamp Replacement.** Handle the lamp with care. Do not turn on power while the lamp is exposed. Disconnect the old lamp wiring and unscrew the support brace that holds the lamp in place. Remove the lamp and discard. Place the new lamp into the block grooves, replace the brace, and reconnect the wiring. The wiring does not have a polarity.

Optical block assembly

- 1 Replace the filter cube into the optical block.
- 2 Lower the circuit board over the filter cube and replace the four screws.
- 3 Replace the optical block lid and plastic shroud.

CAUTION Avoid direct contact with a UV lamp that is powered on. Always power the unit off before servicing or maintaining this instrument.

The unit is now ready for use.

6 Troubleshooting

Always be sure to:

- > Operate the unit in a location isolated from equipment that radiates high-frequency electromagnetic interference.
- > Operate the unit away from direct sunlight.
- > Take care not to spill any liquid into the cuvet well.

Symptoms

Fluorescence values drift

- > Sample solutions must be ambient temperature for consistent readings. (Fluorescence decreases as temperature increases).
- > Protect test samples and the Calibration Standard from light to prevent photobleaching.
- > Take readings immediately after sample preparation.
- > If air bubbles are present, the reading will first drift upward as the light is scattered by the bubbles until they move out of the beam range or dissipate.
- > If particulates are present, the reading may suddenly rise as a particulate drifts in the light path, then drop as it moves out of the beam range.

Wide fluctuations in fluorescence or ppm values

- > Wipe the outside of the cuvet before placing it into the sample chamber.
- > Use consistent measurement techniques, timing of the solvent mix, and point of pipette extract from the sample bottle.

Readings negative or lower than expected

- > Use a freshly prepared hexane sample at ambient temperatures to set the zero and for all subsequent measurements.

Readings are higher than expected

- > Fluorescent enhancement may result from high levels of detergents or background contaminants. When preparing the sample be sure to consistently shake the sample for 5 minutes and allow the sample to stand still for several minutes prior to extraction.

Maintenance, Error and other messages

Please Wait...Warming up

The unit has been turned on or the Lamp Sleep mode had been activated. This message reports that the lamp is being turned on.

Error Identical levels

During calibration, two identical ppm values were attempted to be entered for different sample concentrations, or different ppm values were attempted to be entered for the same sample concentration

Low Lamp

The lamp intensity is reaching low levels and the lamp should be replaced.

No XTR Signal

The sensor is not responding. Call the Arjay Engineering Technical Service Department.

Customer Service Information

Arjay Engineering offers complete technical support for all our products. If you have any questions about how to use this product, or would like to arrange to repair it, please call, fax, or e-mail Arjay or your local Arjay representative.

Ordering Information

Listed below are consumable and replacement parts necessary for the continued operation of your instrument.

Replacement Parts

Lamp, 350 nm for unit #A00515	xxxxxx
Lamp, 254nm for unit #A00516	xxxxxx
Filter Cube for Unit #A00515	xxxxxx
Filter Cube for Unit #A00516	xxxxxx
115 VAC Power Supply Unit with cord	xxxxxx
230 VAC Power Supply Unit with cord	xxxxxx
115 VAC power cord only	xxxxxx
230 VAC power cord only	xxxxxx

Accessories

Filter papers (50 pack)	xxxxxx
Cuvets (50 pack)	xxxxxx
Pipets (50 pack)	xxxxxx
Screening Kit (syringe, disc, 50 papers)	xxxxxx
Solvent Kit (dispenser, jar, timer, 50 cuvetts, 50 pipets)	xxxxxx
Vehicle Jack for 12 vdc source	xxxxxx
Carrying Case	xxxxxx
Rechargeable Battery Pack with 115 VAC charger	xxxxxx
Electric Shaker	xxxxxx

Base Eagle Unit

360 nm unit to target Crude Aromatic Hydrocarbons	A00515
254 nm unit to measure refined and unrefined	A00516

Arjay Engineering Ltd.
Oakville (Toronto), Canada, L6H 6C9
Tel ++1 (905) 829-2418 Fax++1 (905) 829-4701
North America Toll Free 1-800-387-9487



www.arjayeng.com

arjay@arjayeng.com