

Palintest

Kemio

Test Instructions



Kemio

User Manual

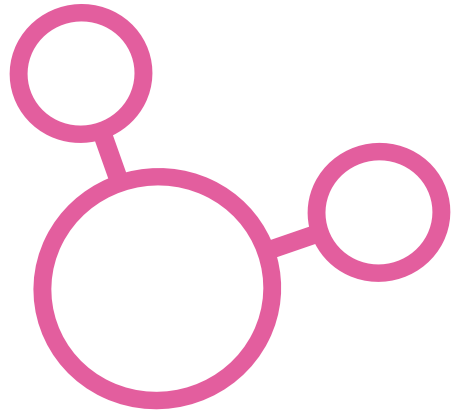
Palintest

Palintest House
Kingsway
Team Valley
Gateshead
Tyne and Wear
NE11 0NS
United Kingdom

0191 491 0808
sales@palintest.com
www.palintest.com

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Introduction

Kemio is a multiparameter instrument with three variants.

Kemio Disinfection can test for bromine, chlorine, chlorine dioxide, chlorite and peracetic acid. Kemio Heavy Metals can test for lead, arsenic, cadmium and copper. Kemio Multi can test for all of these.

These instructions explain the methodology and care points in detail for each of these test types.

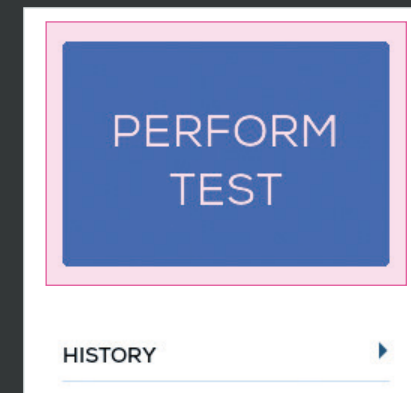
General Guidelines

- Do not touch the sensor surface.
- Keep the instrument clean and dry during use.
- Keep the instrument on a level surface free from vibrations.
- Sensors perform within a specified temperature range. If the sample temperature is outside of the specified temperature range for the sensor, the measurement will proceed as normal but a note will be attached to the test result.
- For optimum performance we recommend sensors are stored at < 4° C (39° F) for over one year and < 20° C (68° F) for less than one year.

Performing a Test

1

On the home page, press
PERFORM TEST or open the lid.



2

Scan the sensor barcode using the
barcode scanner. Hold the barcode
about 12cm (5 inches) from the
instrument. Align the red dot with
the center of the barcode. When the
scan is complete, the instrument
proceeds to the next screen.



Scanning Errors

If the barcode is out of date, a warning will flag. Choose to scan a different sensor or continue anyway. The warning flag will be attached to the test results.

If the barcode refers to a new batch that has not yet been entered into the system, the instrument will prompt the user to add that batch using the QR code, see p.20 of the Kemio Manual. After the batch is added, restart the test from the home screen.

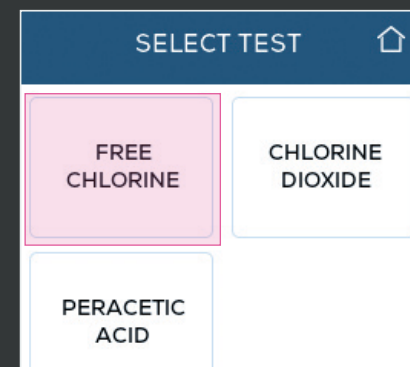
If the barcode is from the wrong sensor type or is not a sensor barcode, or if there is a problem reading the barcode, the instrument prompts the user to use a suitable sensor.

The scanner times out after five seconds. If this happens, press TRY AGAIN to restart the scan or press SELECT to select the batch code from a list.

3

Select the test type.

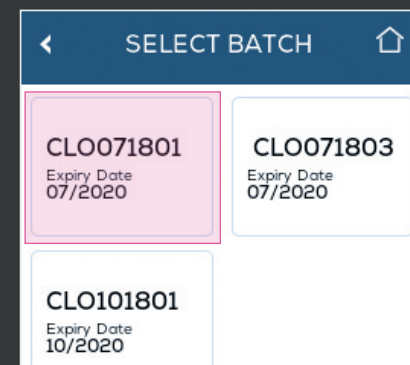
This screen does not appear if only one test type is available. See p. 25 of the Kemio manual for details about selecting tests.



4

Select the correct batch code number from the list.

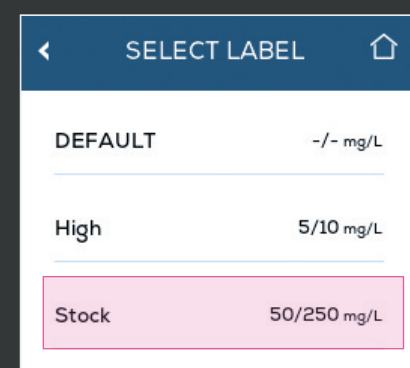
This screen does not appear if the sensor was scanned. See p. 30 of the Kemio manual for details about sensor batch codes.



5

Select the label.

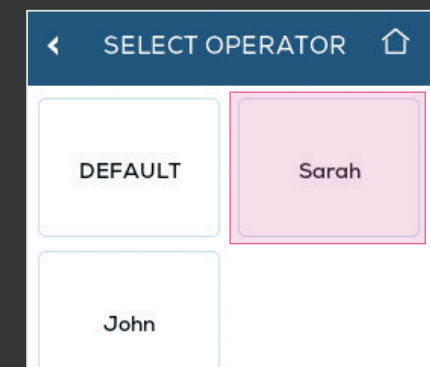
This screen does not appear if only one label is defined for this test type or if tagging labels is disabled. See p. 15 of the Kemio Manual for details about labels and limits.



6

Select or scan the user.

This screen does not appear if only one user is defined or tagging users is disabled. See p. 19 of the Kemio Manual for details about users.



7

If dilution is required for the test and programmed into the label, perform the dilution with the volumes on the screen.

**PERFORM
10 X
DILUTION**

1 PART SAMPLE
9 PARTS WATER

8

Follow the on-screen test instructions below specific to this test type.



Free Chlorine, Total Chlorine, and 'Free and Total Cl' Tests

Palintest's chlorine sensors can be used to measure free and total chlorine simultaneously. On Kemio, select either free chlorine or total chlorine to display a single result, or "free & total" to measure and display both parameters.

When using labels with the free and total test, labels set for both free chlorine and total chlorine are listed. The selected label limits apply only to the parameter they were set for in the configuration menu.

Four different sensor types can be used to measure chlorine:

CLO sensors are used for lower concentrations of chlorine.

- 0.02 mg/L - 10 mg/L of free chlorine
- 0.02 mg/L - 75 mg/L of total chlorine

CHR sensors are used for higher concentrations of chlorine at higher temperatures

- 0.1 mg/L - 25 mg/L of free chlorine (5 °C - 25 °C)
- 1 mg/L - 500 mg/L of total chlorine (5 °C - 30 °C)

CLT sensors are used for higher concentrations of chlorine at lower temperatures (2 °C - 15 °C)

- 0.1 mg/L - 25 mg/L of free chlorine
- 1 mg/L - 500 mg/L of total chlorine

FHR sensors are used for high range free only chlorine

- 0.1 mg/L - 100 mg/L of free chlorine (2 °C - 20 °C)

Care Points

If chlorine dioxide is present in solution, it may interfere with the chlorine reading. Use the degassing step from the chlorite test to produce a chlorine dioxide-free solution.

Ensure the vessel is washed with water between each test.

Results

Free chlorine and total chlorine tests display one parameter each. The free and total test result screen displays both results. The data log stores one entry for each test, requiring twice as much space in memory.

The chlorine test methods display the concentration of free and total chlorine in units of mg/L or ppm Cl⁻.

Test Method

1

Lift the arm. If the arm is already open, the screen is skipped.



2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



If the sensor is not fully inserted, push it in all the way using the edges of the sensor only. Do not touch the dosed chemicals on the electrode surface.



4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



5

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



Total Bromine Test

Total Bromine is measured using Palintest's BRS sensors for concentrations of bromine ranging from 0.2 mg/L - 10 mg/L across the temperature range of 5 - 30 °C.

Care Points

If other oxidants are present in solution, they will interfere with the bromine reading.

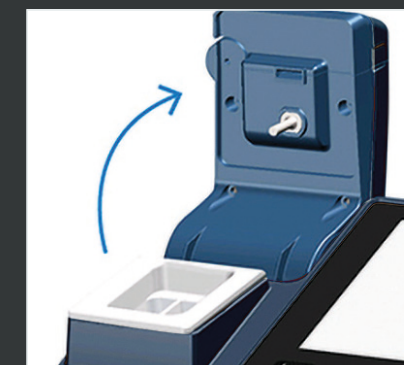
Results

The total bromine test method displays the concentration of bromine in units of mg/L or ppm bromine.

Test Method

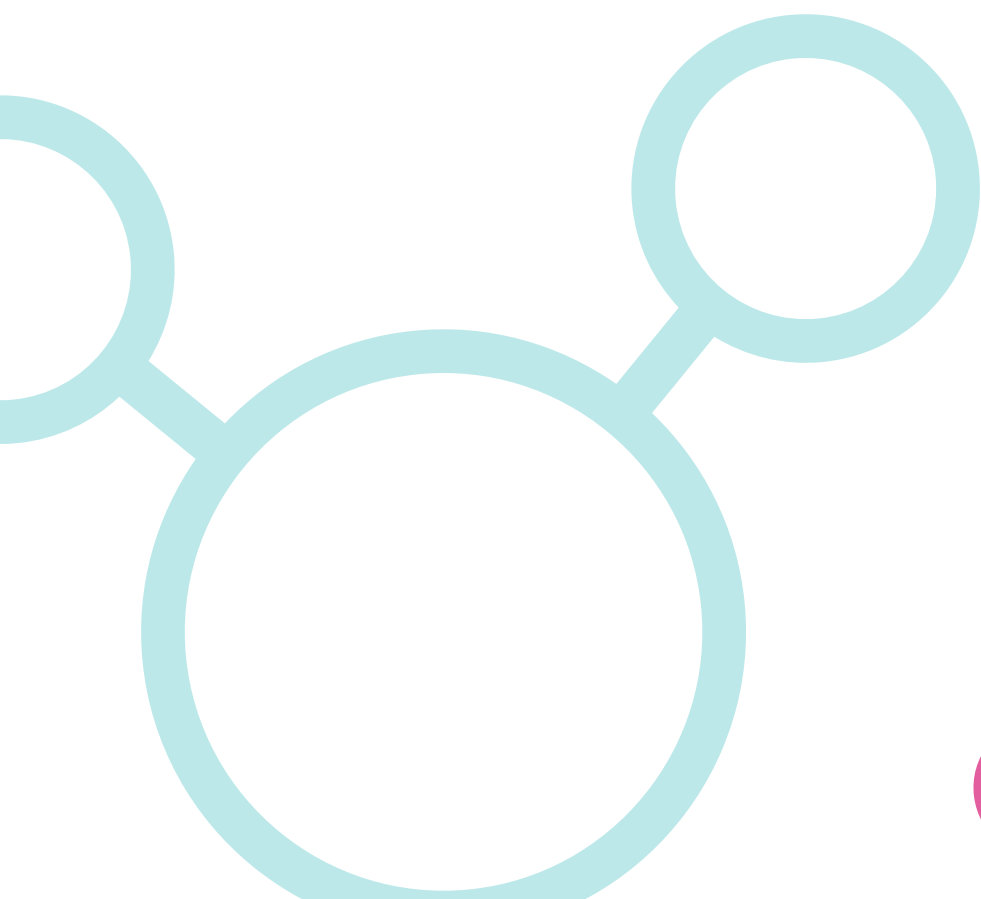
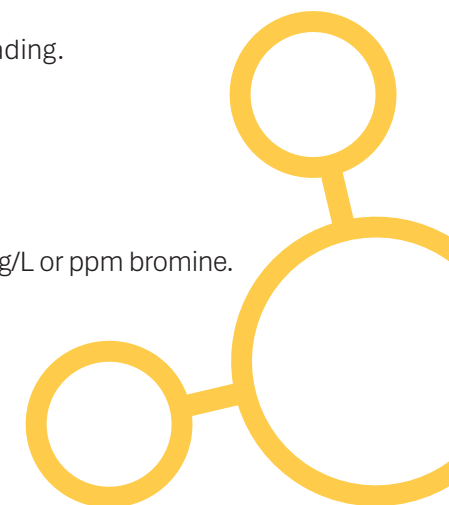
1

Lift the arm. If the arm is already open, the screen is skipped.



2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



If the sensor is not fully inserted, push it in all the way using the edges of the sensor only. Do not touch the dosed chemicals on the electrode surface.

4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



5

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



Peracetic Acid Test (Peroxyacetic acid or PAA)

Peracetic acid (Peroxyacetic acid or PAA) is measured using Palintest's PAA sensors for concentrations of peracetic acid ranging from 5 mg/L to 4000 mg/L.

Three sensor types can be used to measure peracetic acid:

PAA sensors are used for higher concentrations.

■ 10 mg/L - 2000 mg/L of peracetic acid

PAL sensors are used for lower concentrations.

■ 0.02 mg/L - 50 mg/L of peracetic acid

PAH sensors are used for higher concentrations

■ 400 - 4000 mg/L of peracetic acid

Care Points

Hydrogen peroxide is found in solution with peracetic acid. Palintest's PAA and PAL sensors are not strongly affected by the presence of hydrogen peroxide.

Certain fungicides are known to interfere with the PAA sensor. Contact your Palintest representative when measuring water samples with fungicides.

Results

The peracetic acid test method displays the concentration of peracetic acid in units of mg/L or ppm PAA.



Test Method

1

Lift the arm. If the arm is already open, the screen is skipped.



2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



If the sensor is not fully inserted, push it in all the way using the edges of the sensor only. Do not touch the dosed chemicals on the electrode surface.

4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



5

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



Chlorine dioxide is measured using Palintest's CDX sensors, for concentrations of chlorine dioxide ranging from 0.02 mg/L to 50 mg/L.

Care Points

- If there is chlorine present in the sample, use Glycine reagent. If there is no chlorine present, skip the glycine step on p.18
- Chlorine dioxide is a volatile chemical that leaves a sample very easily. Perform a test quickly after taking a sample. Do not agitate the sample.

Results

The chlorine dioxide test method displays the concentration of chlorine dioxide in units of mg/L or ppm ClO₂.



Test Method

1

Lift the arm. If the arm is already open, the screen is skipped.



2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



If the sensor is not fully inserted, push it in all the way using the edges of the sensor only. Do not touch the dosed chemicals on the electrode surface.

4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



5

If chlorine or copper is present in the solution, add three drops of glycine reagent to prevent them from interfering with the measurement. Use the stir rod to mix the sample. If no chlorine or copper are present, skip this step.



6

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



The chlorite test method involves three separate measurements of various chemical combinations in the sample, followed by some calculations to determine the total chlorite concentration. The test procedure must be followed carefully to ensure the chemical reactions and measurements occur correctly.

A chlorine dioxide measurement forms a part of the chlorite test. However, in the chlorite test type, only labels and limits for chlorite can be selected.

Care Points

- The chlorite test uses three CDX sensors. These must all be from the same batch of sensors. If sensors from different batches are used, it may produce inaccurate results.
- If there is chlorine present in the sample, use glycine reagent during the first CDX measurement. If there is no chlorine present, skip the glycine step on p. 21.
- Chlorine dioxide is a volatile chemical that leaves a sample very easily. Perform the first test quickly after taking a sample for an accurate measurement. Do not agitate the sample.
- If the chlorite test method is interrupted, or if an error occurs partway through the test procedure, the entire test must restart from the beginning to ensure accurate results.
- Use separate vessels for the first CDX test before the degassing step, and the second and third tests with CR-1 and CR-2. Do not mix up the two vessels.
- Do not let the kit stay wet. Trapped humidity could damage the kit components.

Results

The chlorite results screen displays two readings: the calculated chlorite result and the chlorine dioxide result measured by the first sensor.

The chlorite test method displays the concentration of chlorine dioxide in units of mg/L or ppm ClO₂, and the concentration of chlorite in units of mg/L or ppm ClO₂.



Test Method

1

Lift the arm. If the arm is already open, the screen is skipped.



2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



If the sensor is not fully inserted, push it in all the way using the edges of the sensor only. Do not touch the dosed chemicals on the electrode surface.

4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



4

Fill the right side of the vessel to the ridge. If there is excess sample, it will pour into the left side of the vessel. Do not overfill both sides or water can splash onto the sensor contacts and interfere with the test.



5

If chlorine or copper is present in the solution, add three drops of glycine reagent to prevent them from interfering with the measurement. Use the stir rod to mix the sample. If no chlorine or copper are present, skip this step.



6

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



7

During the one minute electrochemical measurement period, set up the degasser as shown. Ensure the two plastic halves of the degasser are properly connected. Ensure the filter is installed correctly.





8

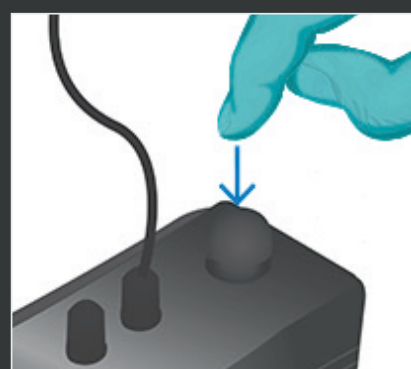
Fill the degasser vessel up to the mark with fresh sample.



9

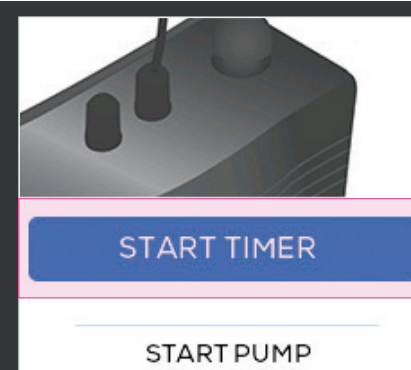
Press the start button on the pump to begin degassing the chlorine dioxide from the sample.

It is not a problem to run the degasser for longer than the timer displayed on the screen.



10

Press the START TIMER button to begin the timer. The displayed time is calculated based on the concentration of chlorine dioxide measured in the previous step.



11

While the degasser is running, prepare for the next sensor test. Open the lid, remove the sensor, and discard the old sample.

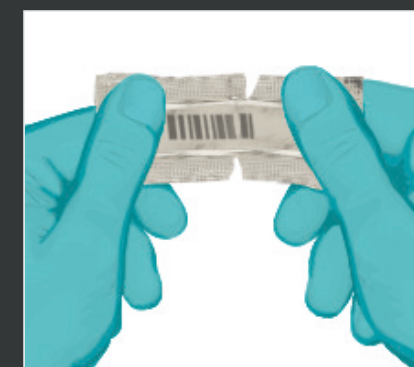
At the end of the degassing period, perform a test on the degassed sample.



12

Tear each side of the second CDX sensor packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



13

Fill the right side of the vessel to the line with degassed water.



14

Add three drops of CR-1 reagent.



15

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



16

Open the arm, discard the sensor. KEEP the sample from the previous test.



17

Add three drops of CR-2 reagent.



18

Close the arm with no sensor inserted.



19

Wait two minutes while chlorite reacts with the CR-2 reagents.
At the end of the two minute period perform the final test.

REACTION IN PROGRESS
01 :57

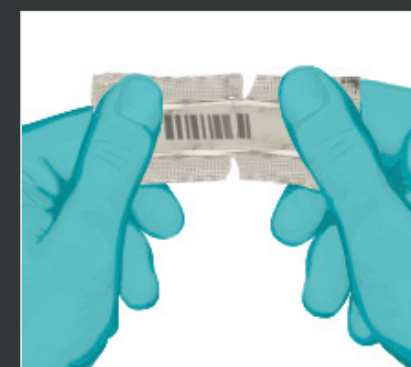
20

Lift the arm. If the arm is already open, the screen is skipped.



21

Open the foil packet.



22

Hold the final CDX sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



23

Pull the foil off the sensor. Close the arm. The test will start automatically.

Wait one minute while the instrument performs the electrochemical measurement.



The following metal sensors are available for use with Kemio Heavy Metals and Kemio Multi.

Metal	Sensor Type	Range
Lead	MPB	1 - 100 µg/L (or ppb)
Cadmium	MCD	0.5 - 10 µg/L (or ppb)
Copper	MCU	0.1 - 2.0 mg/L (or ppm)
Arsenic	MAS	2.0 - 250 µg/L (or ppb)

Care Points

- Lead, Cadmium and Copper sensors contain a very small amount of mercury. Products containing mercury may be regulated by Local, State or Federal laws. Check with your local regulator and dispose of appropriately after use.
- Avoid touching the chemicals on the sensor surface.
- Avoid cross-contamination between samples ensuring all equipment used is clean.
- Ensure the Soluprep tablets are completely dissolved before starting the test.

Results

The lead, cadmium and copper results screens display a single reading, in units of µg/L or ppb Pb, Cd or Cu.

Separate Arsenic tests are available for either Total Arsenic or Arsenic (III). Selecting, Speciated Arsenic will provide results for Total Arsenic, Arsenic (III) and Arsenic (V) in units of µg/L or ppb As.



Test Method for Lead, Cadmium and Copper

1

Lift the arm. If the arm is already open, the screen is skipped.



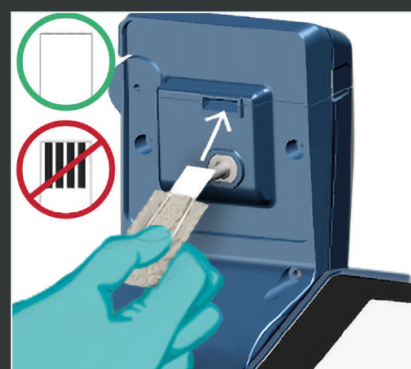
2

Tear each side of the packet, then twist and tear the short side from the packet, revealing the sensor tracks. Do not touch the dosed half of the sensor.



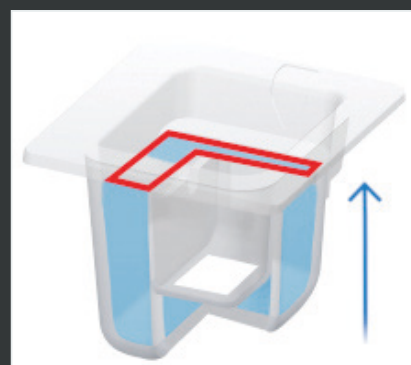
3

Hold the sensor through the foil packet only, with the white side facing up. Slide it all the way in, until the end stops against the back of the slot.



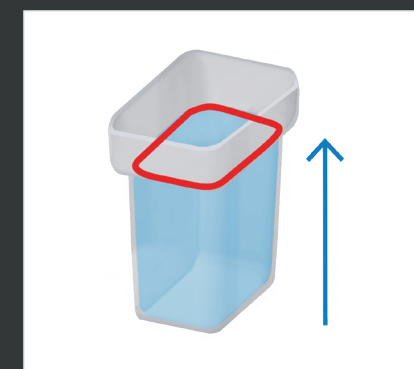
4

Fill the L-shaped vessel to the line. This is so that the temperature probe is in contact with the sample for temperature compensation.



5

Fill the disposable vessel to the shoulder. Do not overfill, or water can splash onto the sensor contacts and interfere with the test.



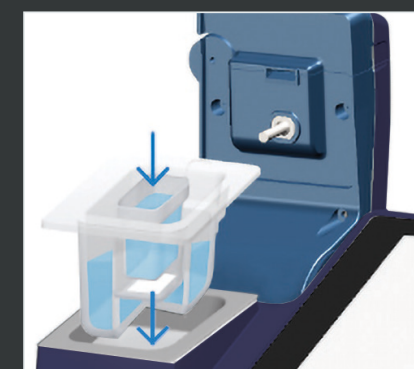
6

Add one Soluprep SP-A tablet into the disposable vessel. Crush and stir using the crushing rod until the tablet is fully dissolved.



7

Insert both vessels into the instrument.



8

Remove the foil and close the arm to start the test. Depending upon the test, Kemio will take around 3-5 minutes to perform the measurement and then display the result.

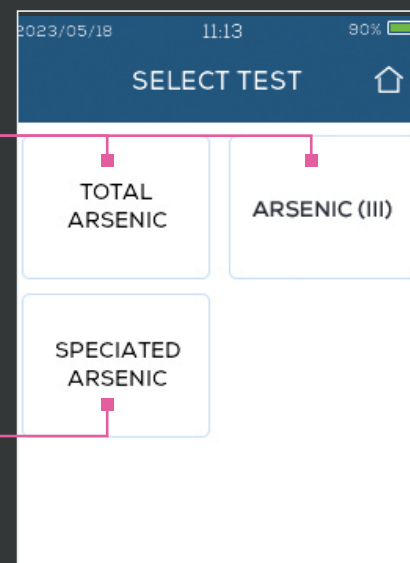


Test Methods for Arsenic

Total Arsenic or Arsenic(III) can be selected as standalone tests. Arsenic(V) can then be calculated as follows.

$$\text{Arsenic (V)} = \text{Total Arsenic} - \text{Arsenic (III)}$$

Speciated Arsenic. Kemio will guide through the complete procedure for a Total Arsenic test followed by an Arsenic (III) test. The instrument will then use these results to also calculate and display the Arsenic (V).



Test Method for Total Arsenic & Arsenic (III)

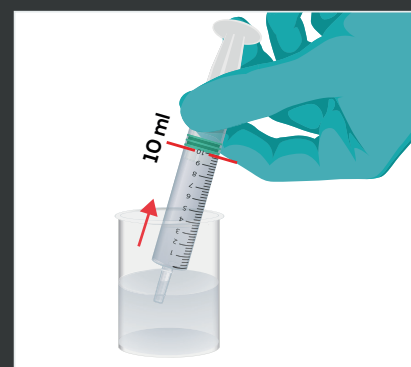
1

Lift the arm. If the arm is already open, the screen is skipped.



2

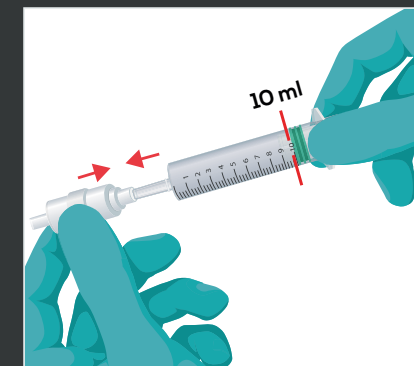
Fill syringe with sample to the 10 mL line



3

Attach the ion exchange cartridge to the syringe.

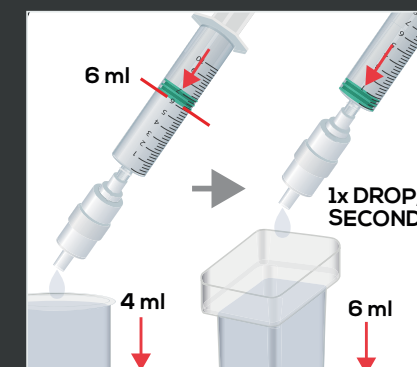
(Two cartridges are provided in a pack of one hundred sensors. Therefore, it is recommended that the cartridge is used up to 50 times before replacing with a new one.)



4

Flush out the cartridge by expressing 4 mL of sample into a waste container. Then, express the remaining 6 mL into the disposable sample holder.

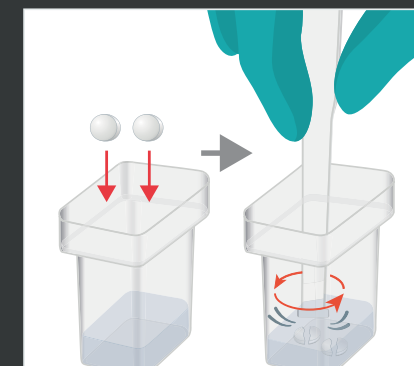
IMPORTANT: Use a gentle pressure, so that droplets of sample emerge slowly (around 1 per second).



5

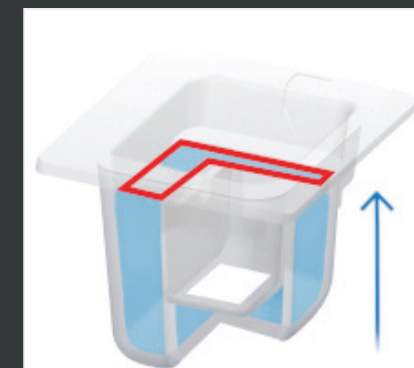
Add TWO Soluprep SP-T tablets. Crush and stir thoroughly.

NOTE: Total Arsenic test requires TWO Soluprep-T tablets and Arsenic(III) requires ONE Sp-A tablet.



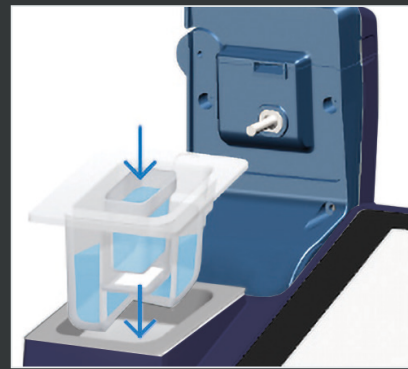
6

Fill the L-Shaped vessel with further unfiltered sample. This will enable Kemio to measure the temperature and compensate the result.



7

Place both the L-shaped vessel and the disposable sample vessel in the instrument.



8

Take a Kemio MAS sensor and tear the foil on each side. Then, twist, tear and remove the short end of the foil from the sensor to reveal the sensor contacts. Do not touch the active surfaces of the sensor.

Ensure the sensor is pushed into the remaining foil packaging to keep the active surfaces protected.



9

Holding the sensor by the foil, with the white side up, slide it fully into the instrument.



10

Remove the foil from the sensor and gently close the arm.

The instrument will take about two minutes to perform the measurement and then display the concentration of Total Arsenic.

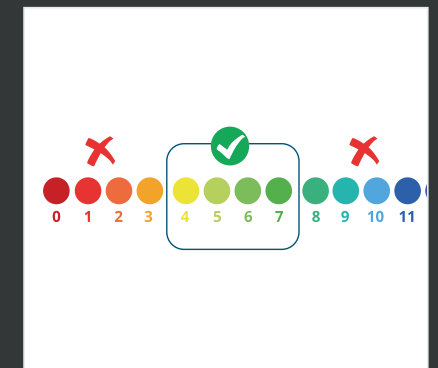


Arsenic Testing – Critical Care Points

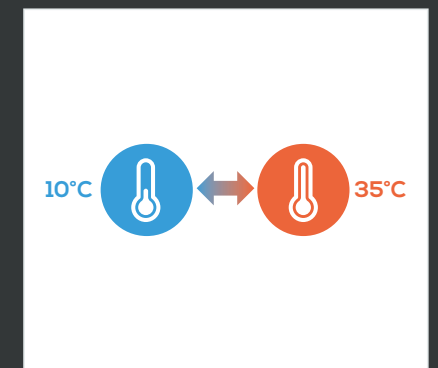
If the sample is turbid (cloudy) then it will need to be filtered to avoid blocking of the ion exchange cartridge. This can be done simply by inserting a particulate filter to the syringe in front of the ion exchange cartridge.



Samples that have been acidified must be neutralized before analysis. Acceptable range is pH 4 - 7.



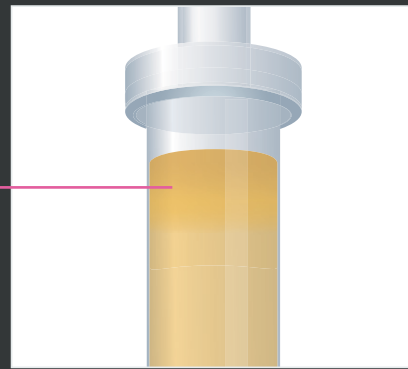
Ensure that sample is within the temperature range 10 °C - 35 °C.



Always store the ion exchange cartridge in the tube it is supplied in.



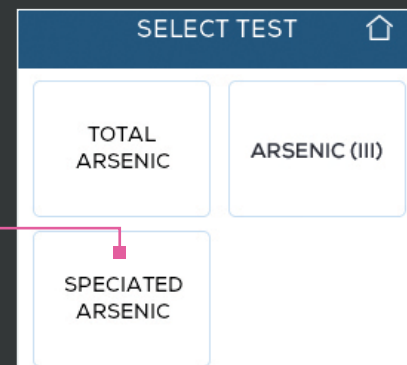
Darkening of the inlet end of the ion exchange cartridge is normal with some types of water. If this color extends the entire length of the filter then it should be discarded.



Speciated Arsenic requires two sensors to be used during the test procedure.



For valid results, these two sensors must have the same batch number.



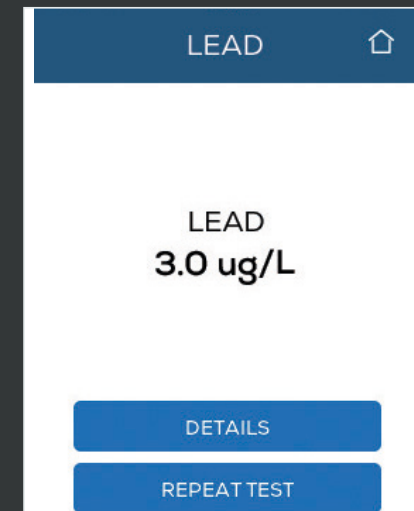
Check and adhere to all local regulations regarding the disposal of the sensors, ion exchange cartridge and sample water.



1

At the end of the countdown, the test results will display on screen. The number of results displayed depends on the test type.

Disinfection test results are displayed in mg/L or ppm. Metals tests results are displayed in $\mu\text{g/L}$ or ppb.



Dilution

If a label with a dilution factor was used during the test, the factor will have applied to the number on screen. For example, if a 50mg/L solution was diluted 5X and measured by Kemio using a label with a 5X dilution factor, the result displayed on the screen will be 50mg/L.

It is critical that the correct dilution is performed when a label with a dilution factor is used.

No Limits

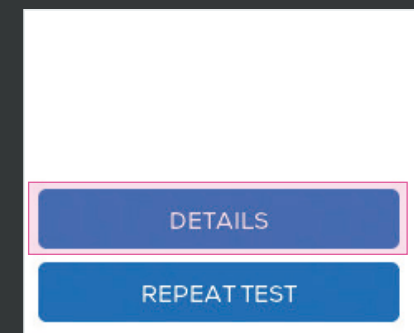
If no label or a label with no limits was used during testing, the page title will be DETAILS on a blue background.

Limits

If a label with limits was used, either a green PASS or a red FAIL will be displayed at the top of the screen. This is simple traffic light system enables a quick and clear decision by the operator.

2

Press DETAILS to view the complete information for the test.



If a warning or flag was raised before or during testing, a note will be added to the test record. The result will still be displayed. A reading that falls within the test limits will still be a pass. However, the note will indicate in the record that the test was not normal.

Details

1

The first line displays the test type and the measured concentration (after dilution if applicable).

Up to three test types and concentrations can be displayed in this way.

Label indicates which label was selected at the start of the test. If no label was selected, DEFAULT is displayed.

Limits indicates the minimum and maximum acceptable concentrations set by the label that was selected. If a limit is not set on the label or if no label was selected, “-” is displayed.

Temperature indicates the temperature of the sample in the vessel. Note: this may differ from the sample temperature.

User indicates which user was selected at the start of the test. If no user was selected, DEFAULT is displayed.

Time indicates the time when the test was performed.

Date indicates the date on which the test was performed.

Batch Code indicates the batch used for the test.

Dilution factor indicates the multiplier on the measured result to produce the displayed result. Default is 1.

Press **ADD REFERENCE** to add information from a barcode (or the information can be typed in manually) to enrich the data record. See p. 9 in the instruction manual for details on producing and using barcodes.

Press **ADD NOTES** to type information about the test using the on-screen keyboard. Maximum of 48 characters. After a failed test, it is recommended to write an explanatory note or explain the corrective actions taken, as the information will be stored alongside the test in memory.

Error messages are stored in the note field automatically.

After the test results are displayed, the user must complete the test by removing the sensor, disposing of the sample and cleaning the instrument. This protects the instrument, prevents microbial growth, prevents spills, and prepares the instrument for the next test. Kemio will prompt the user to complete these actions.

Software Upgrade

After viewing the results, the user has the choice to:

- 1 Finish the test and clean for the instrument
- 2 Return to the home screen
- 3 Perform another test
- 4 Shut down the instrument

A. Finish The Test (Disinfection Test)

1

Open the lid.



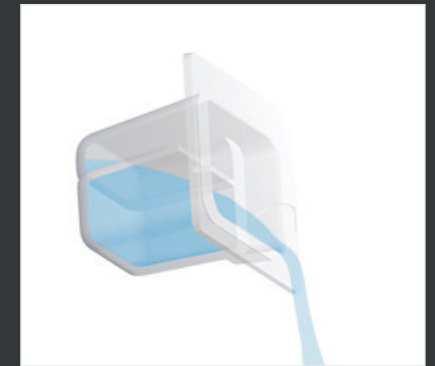
2

Remove the sensor.



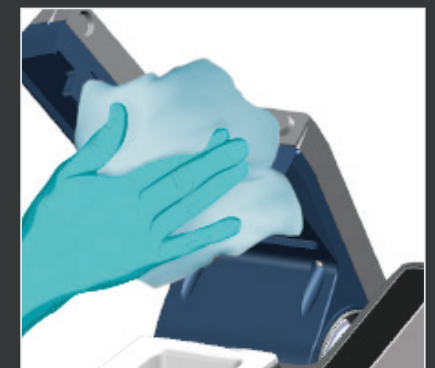
3

Discard the sample.



4

Add one Soluprep SP-A tablet into the disposable vessel. Crush and stir using the crushing rod until the tablet is fully dissolved.



5

Close the lid. Kemio will return to the results screen.

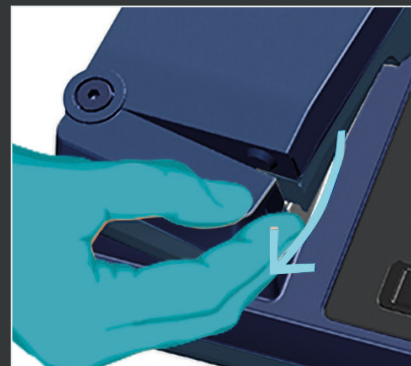


Kemio does not detect whether the sensor and sample have been removed - only that the lid has been opened to do so. Take care of the instrument and ensure they are properly removed.

A. Finish The Test (Metals Test)

1

Open the front lid to drop the sensor into the disposable vessel.



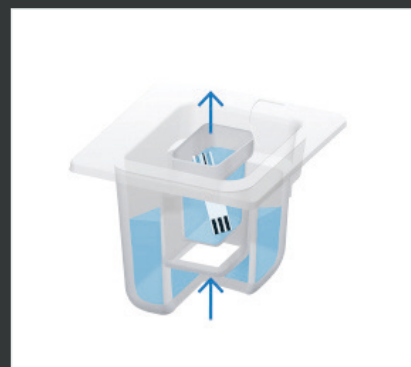
2

Open the lid.



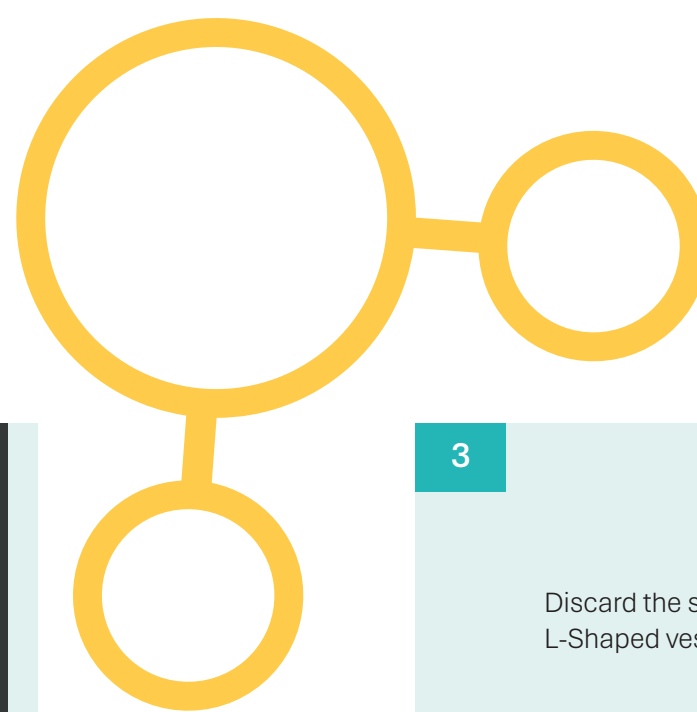
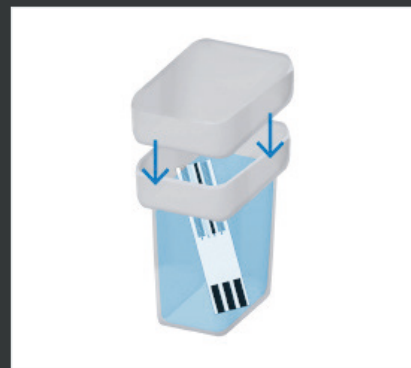
3

Remove both vessels from Kemio.



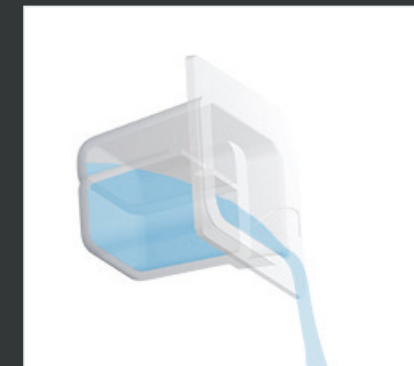
4

Place a cap on the disposable vessel. If required by local regulations, dispose of the sample, sensor and vessel in a secure manner.



3

Discard the sample from the L-Shaped vessel



Kemio does not detect whether the sensor and sample have been removed - only that the lid has been opened to do so. Take care of the instrument and ensure they are properly removed.

B. Return To The Home Screen

If the “Finish the test” instructions have not yet been completed, Kemio will prompt the user to do these. After the lid is closed, Kemio will return to the home screen.

If the lid has already been opened, Kemio will proceed directly to the home screen.

C. Perform Another Test

Press REPEAT TEST.

When retesting, Kemio reuses the same label, user and batch information from the previous test.

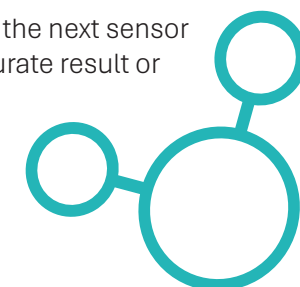
If testing a sample that should use a different label, if a different user is testing or if the next sensor comes from a new batch, DO NOT press REPEAT TEST. This could lead to an inaccurate result or incorrect information. Instead, press the HOME button and PERFORM TEST.

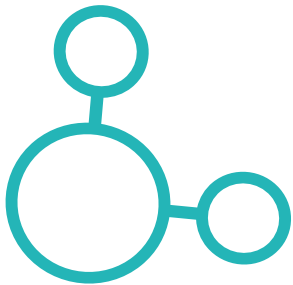
D. Shut Down The Instrument

Press the power button.

If the user presses and holds the power button before opening the lid, Kemio will display a warning message reminding the user to discard the sensor and sample, and then turn off.

If the lid has already been opened, the regular “Goodbye” screen will display and Kemio will turn off.



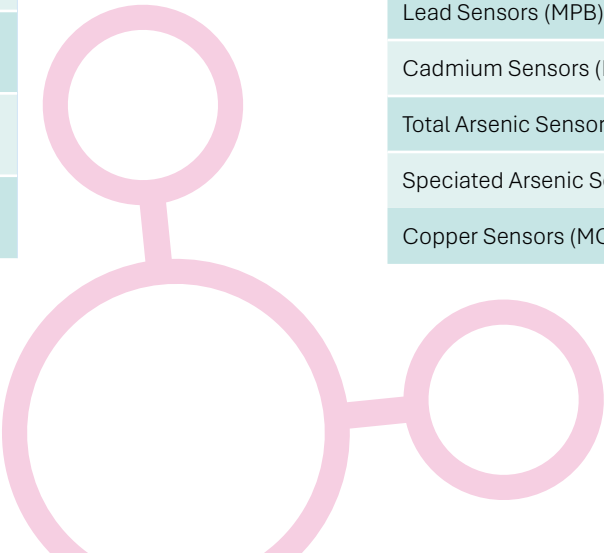


Sensor Performance

Sensor type	Test type	Range	Temp Range (°C)	Resolution (mg/L)	Precision (mg/L)
CLO	Free Chlorine	0.02-10 (mg/L)	5-30	0.01 up to 5.0 0.1 up to 10	≤ 0.05 @ 1.0 mg/L, 20°C
	Total Chlorine	0.05-75 (mg/L)	5-30	0.01 up to 5.0 0.1 up to 20 1 up to 75	≤ 0.5 @ 10 mg/L, 20°C
CHR	Free Chlorine	0.1 - 25 (mg/L)	5 - 25	0.01 up to 5.0 0.1 up to 25	≤ 2.0 @ 20 mg/L, 10°C
	Total Chlorine	1 - 500 (mg/L)	5 - 30	0.1 up to 20 1 up to 500	≤ 10.0 @ 200 mg/L, 10°C
CLT	Free Chlorine	0.1 - 25 (mg/L)	2 - 15	0.01 up to 5.0 0.1 up to 25	≤ 2.0 @ 20 mg/L, 5°C
	Total Chlorine	1 - 500 (mg/L)	2 - 15	0.1 up to 20 1 up to 500	≤ 0.01 @ 200 mg/L, 5°C
FHR	Free Chlorine	0.1 - 100 (mg/L)	2 - 20	0.02 up to 10 0.1 up to 100	≤ 2.25 @ 30 mg/L, 2°C ≤ 5.63 @ 75 mg/L, 14°C
CDX	Chlorine Dioxide	0.02 - 50 (mg/L)	5 - 40	0.01 up to 10.0 0.1 up to 50	≤ 0.05 @ 1.0 mg/L, 20°C
	Chlorite	0.02 - 50 (mg/L)	5 - 40	0.01 up to 2.5 0.1 up to 20 1.0 up to 50	≤ 0.05 @ 1.0 mg/L, 20°C
PAA	Peracetic Acid	10 - 2000 mg/L	5 - 30	0.1 up to 20.0 1 up to 500 5 up to 2000	≤ 1.25 @ 25 mg/L, 10°C ≤ 10 @ 200 mg/L, 20°C ≤ 75 @ 1500 mg/L, 20°C
PAL	Peracetic Acid	0.02 - 10 (mg/L)	2 - 30	0.01 up to 5 0.1 up to 20	≤ 0.04 @ 0.2 mg/L, 20°C ≤ 0.05 @ 1.0 mg/L, 5°C
PAH	Peracetic Acid	400 - 4000 (mg/L)	10 - 60	1 up to 1000 10 up to 4000	≤ 125 @ 2500 mg/L, 50°C ≤ 175 @ 3500 mg/L, 50°C
MPB	Lead	1 - 100 (µg/L)	5 - 35	1 up to 100 µg/L	≤ 1.0 µg/L @ 5 ug/L, 20°C
MCD	Cadmium	0.5 - 10 (µg/L)	5 - 35	0.1 up to 10.0 µg/L	≤ 1.0 µg/L @ 5 ug/L, 20°C
MCU	Copper	0.1-2.0 (mg/L)	5 - 35	0.001mg/L up to 0.6mg/L 0.005mg/L up to 2.0 mg/L	≤ 0.1mg/L @ 0.5mg/L, 20°C
BRS	Bromine	0.2 - 10 (mg/L)	5 - 30	0.01 up to 1 mg/L 0.1 up to 10 mg/L	≤ 20% up to 1 mg/L ≤ 10% 1 - 10 mg/L
MAS	Arsenic	2 -250 (µg/L)	10 - 35	0.1 µg/L	≤ 20% up to 5 µg/L ≤ 10% 5 - 250 µg/L

Reorder Codes

Description	Product Code
Chlorine Free High Range Sensors (FHR) (100 pack)	KEM21FHR
Chlorine Free High Range Sensors (FHR) (500 pack)	KEM25FHR
Chlorine Standard Range Sensors (CLO) (100 pack)	KEM21CLO
Chlorine Standard Range Sensors (CLO) (500 pack)	KEM25CLO
Bromine Sensors (BRS) 100 Pack	KEM21BRS
Chlorine High Range Sensors (CHR) (100 pack)	KEM21CHR
Chlorine High Range Sensors (CHR) (500 pack)	KEM25CHR
Chlorine High Range Low Temp Sensors (CLT) (100 pack)	KEM21CLT
Chlorine High Range Low Temp Sensors (CLT) (500 pack)	KEM25CLT
Chlorine Dioxide and Chlorite Sensors (CDX) (100 pack)	KEM21CDX
Chlorine Dioxide and Chlorite Sensors (CDX) (500 pack)	KEM25CDX
Glycine Reagent	PT549
CR-1 Reagent	PT546
CR-2 Reagent	PT547
Peracetic Acid Sensors (PAA) (100 pack)	KEM21PAA
Peracetic Acid Sensors (PAA) (500 pack)	KEM25PAA
Peracetic Acid Sensors Low Range (PAL) (100 pack)	KEM21PAL
Peracetic Acid Sensors Low Range (PAL) (500 pack)	KEM25PAL
Peracetic Acid Sensors High Range (PAH) (100 pack)	KEM21PAH
Peracetic Acid Sensors High Range (PAH) (500 pack)	KEM25PAH
Lead Sensors (MPB) (10 pack)	KEM22MPB
Cadmium Sensors (MCD) (10 pack)	KEM22MCD
Total Arsenic Sensors (100 pack)	KEM100M-TAS
Speciated Arsenic Sensors (III & V) (100 pack) 50 tests each	KEM100M-SAS
Copper Sensors (MCU) (10 pack)	KEM22MCU



Technical Support

Kemio is manufactured in the UK by Palintest Ltd, please see the technical support contacts by region below

Head Office

T: +44 (0)191 491 0808
E: sales@palintest.com

Palintest House
Kingsway
Team Valley
Gateshead
Tyne and Wear
NE11 0NS
United Kingdom

APAC

T: +61 1300 13 15 16
E: apac@palintest.com

Palintest
17 Maud Street
Newstead
QLD 4006
Australia

Americas

T: +1 720 221 6878
E: info@palintestusa.com

Palintest
600 Corporate Circle
Suite F
Golden
80401
USA

