Pyxis

Data Sheet

SP-710 Free/Total Chlorine Testing

TMB Chlorine Methods, Reagents & Calibration

TMB Test Method Description

The Pyxis SP-710 offers both Free & Total Chlorine methods based on the tetramethylbenzidine (TMB) chemistry. Although less known for its use, the TMB method for Free and Total Chlorine measurement is highly regarded as superior to the DPD method for its rapid result development and superior stability. These unique liquid reagents contain the TMB reagent for both free or total chlorine, a pH buffer, and a polymeric binder. When three drops of liquid reagent are administered into the sample vial of SP-710, the TMB reagent chemically rapidly reacts with free or total chlorine present to develop a stable yellow colored solution. The SP-710 measures the absorbance value of the resulted yellow solution to directly determine the free or total chlorine concentration in the sample as high as 2.20ppm for each method. Each kit is provided in a 30mL easy use dropper bottle which is sufficient inventory for up to 230 individual tests offering a lower cost per test than conventional DPD powder pillows.

TMB Free & Total Chlorine Dropper Kits

TMB Chlorine Secondary Standard Check & Calibration Solution

To ensure the accuracy of your SP-710 TMB Chlorine method, Pyxis has developed a unique liquid 1.0ppm Chlorine secondary calibration standard. This liquid is provided in a 125mL bottle and can be used as a secondary reference standard for calibration verification as well as slope calibration standard of the unit itself as either 1.0ppm Free and Total Chlorine. Stable for up to 6 months, this liquid is easy to use, requires no reagent application and has been specially designed at a low pH (4.0) and can be used to pre-clean the sample cell prior to its use as a secondary calibration check and slope calibration standard.

TMB Chlorine Secondary Standard Kit

TMB Free & Total Chlorine Method Applications

- Industrial & Process Water Applications
- Influent & Wastewater Effluent Applications
- USEPA Accepted Chemistry

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Features of Pyxis TMB Chlorine Testing Technology

- Single liquid dropper bottle provides easier use & safety versus a powder pillow
- One dropper bottle (30mL) contains volume enough for 230 tests
- TMB acidic reaction pH eliminates $CaCO_3$ and $CaPO_4$ precipitation common in the DPD method
- TMB Method is EPA accepted chemistry
- TMB Method provides rapid reaction results versus DPD
- TMB Method provides superior stability versus DPD
- Pyxis TMB Chlorine Secondary Standard Solution can be used for Verification & Slope Calibration
- Both Test Kits & Secondary Standard Solution kit includes disposable Pipette for sample mixing
- Secondary Standard Solution Kit is formulated at pH 4.0 to enable sample cup pre-cleaning
- Secondary Standard Solution Kit also includes Pipe Cleaner Brush for Pre-cleaning of sample cup

TMB Dropper Kit Specifications

Items	**Parameter**
Free Chlorine Kit Range	0.02 – 2.2 ppm (± 0.02ppm)
Total Chlorine Kit Range	0.02 – 2.2ppm (± 0.02ppm)
Accuracy	± 0.02ppm or 3% of reading whichever is greater
Precision	0.05 ppm (3 sigma)
Reaction Time	2 minutes
Sample Temperature	50-86°F (10-30°C)
Reagent Volume Added	3 drops
Storage Temperature	4-40°C (40-104°F)
Shelf Life	6 Months
Sample Cup Volume of SP-710	2 ml
Container	30mL Dropper Bottle (230 Tests Each)

TMB Secondary Standard Solution Kit Specifications

Items	**Parameter**
Secondary Standard Solution	1.0ppm as Chlorine *(both Free & Total)*
Accuracy	± 0.03 ppm
Form	Liquid – Lemon Yellow in Color
Storage Temperature	4-40°C (40-104°F)
Shelf Life	6 Months
Container	125mL Amber Narrow Mouth Bottle
Secondary Standard Solution	1.0ppm as Chlorine

Ordering Information

SP-710	*(pH, Conductivity, TDS, ORP, Temp, PTSA, F & T Cl_2)*	P/N: 50352
TMB Free Chlorine Reagent (x 230 tests)		P/N: 63901
TMB Total Chlorine Reagent (x 230 tests)		P/N: 63902
TMB Chlorine Secondary Standard Solution 1 ppm (125mL Bottle)		P/N: 21038

Free & Total Chlorine Measure Procedure for SP-710

1. Click **MEASURE** button (labeled with <), until the caption over the left button highlights **Chlorine.** Click the **OK** button to launch chlorine measurement page as Figure 1.

Figure 1. Chlorine Measurement

2. Triple rinse the Conductivity/Fluorometer sample cell of the SP-710 with the sample to be measured.
3. Fill the sample cell fully with the sample to be measured. (be sure to prevent air bubbles by using dropper or adding sample slowly.
4. Click **ZERO** button (labeled with <)

Figure 2. Chlorine Zero

5. Drop 3 drops of Free or Total Chlorine Reagent into the 2ml sample well. Draw out the sample water from the sample cell using the disposable pipette to provide mixing. Once the sample has been drawn into the reagent pipette, shake the pipette or squeeze the sample back into the sample cell allowing the reagent to fully dissolve. You should notice a yellow color developed if chlorine is present.
6. Click **TIMER** button (labeled with >), the SP-710 starts 2-minute reaction timer.

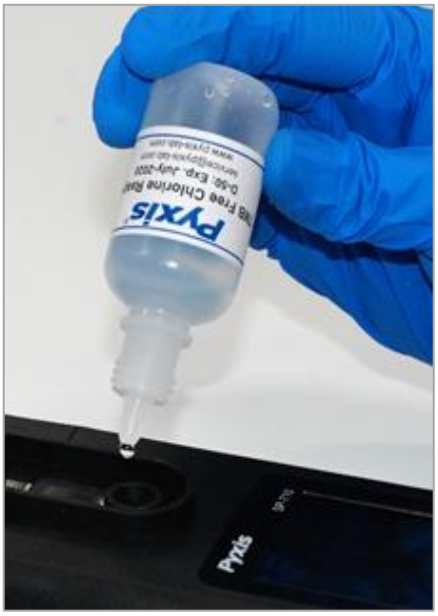

Figure 3. Add 3-Drops of TMB Reagent

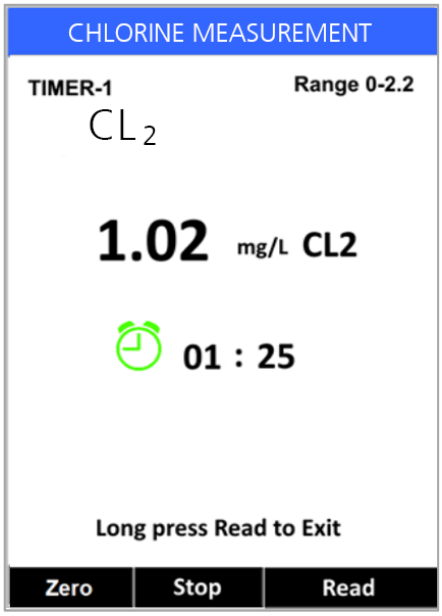

Figure 4. Click TIMER to begin Sample Reaction

7. The SP-710 will continuously display the free or total chlorine concentration, click the **STOP** button (labeled with >) to stop measurement if the real-time readings remain steady or you may wait for the 2-minute timer to end. **RECORD FINAL VALUE as ppm Free or Total CHLORINE.**

Free & Total Chlorine Calibration Procedure for SP-710

1. Click **MEASURE** button (labeled with <), until the caption over the left button highlights **Chlorine.** Click the **OK** button to launch chlorine measurement page as Figure 1.
2. Fill the sample cell with DI water, and click **ZERO** button (labeled with <)
3. Dump out the DI water from sample cell, fill the sample cell with Pyxis 1.0ppm TMB Chlorine Secondary Standard, and click **READ** button (labeled with OK)
4. SP-710 displays TMB chlorine concentration value in the screen as Figure 5.
5. Click **CAL** button (labeled with >) to enter calibration page as Figure 6

Figure 5 Measure with TMB Secondary Standard

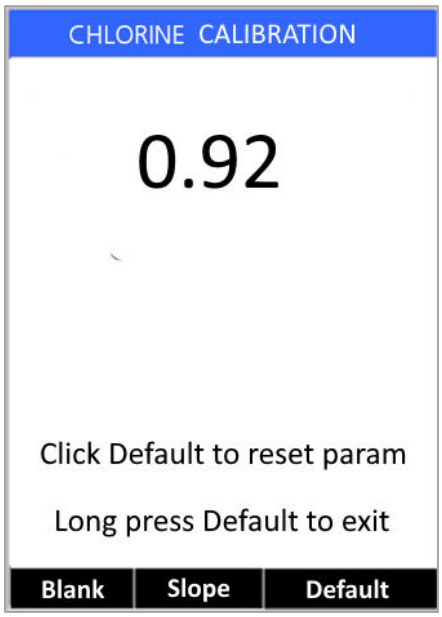

Figure 6 Chlorine calibration page

6. Click the **SLOPE** button (labeled with >) to start slope calibration as Figure 7 and click **+** (labeled with <) or - (labeled with >) to adjust the standard value to 1.0 as Figure 8.

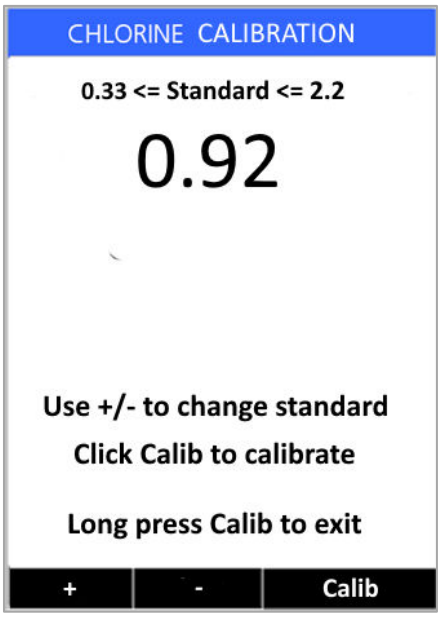

Figure 7. Slope calibration page

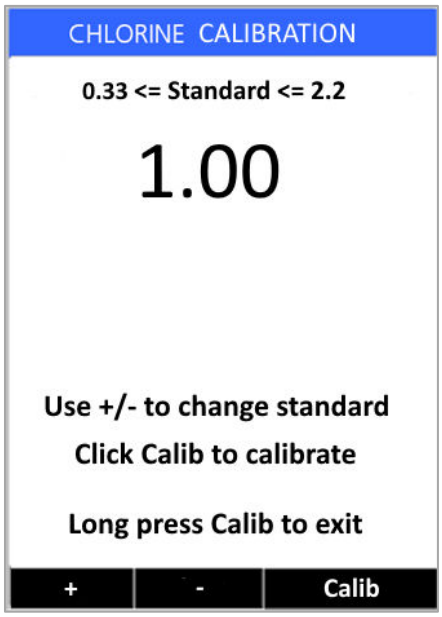

Figure 8. Adjust standard value

7. Click the **CALIB** button (labeled with OK) to start slope calibration, calibration results will be displayed as Figure 9.

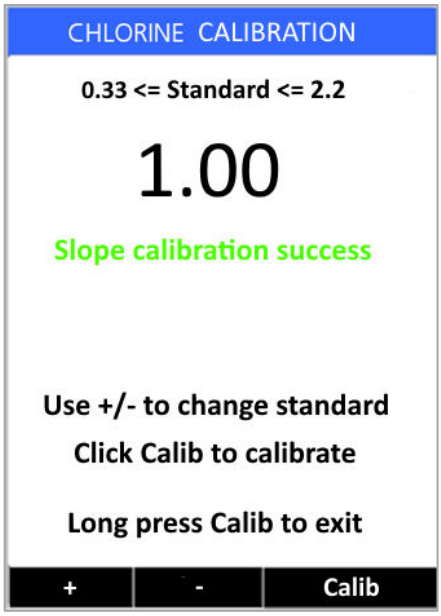

Figure 9. Slope calibration succeed