

# eXact® MICRO 10

Advanced Photometer System

Revision 03/15/17  
486699-K Standard Kit  
486699-S Starter Kit

## Instruction Manual

IDEAL FOR TESTING POOLS AND SPAS.  
ACCEPTED BY MOST HEALTH DEPARTMENTS  
FOR COMMERCIAL POOL AND SPA TESTING.

**USEPA, DIN, & ISO Compliant for Free, Combined, & Total Chlorine Testing**  
(4500-CL G, DIN Standard 38 408 G4, ISO 7393/2)

eXact® Micro 10 pH (Phenol Red), Cyanuric Acid (Melamine), and Chlorine (DPD) are accepted by Health Departments for monitoring commercial pools because they use approved reagents.

Use in accordance with U.S. Patent No. 7,333,194, U.S. Patent No. 7,491,546,  
South African Patent No. 2007/0628, Euro Pat No. 1,725,864 DE FR UK



Micro 10 is  
Manufactured  
and tested in  
an ISO 9001  
Facility

The eXact® Micro 10 Advanced  
Photometer System has been  
designed for use with the eXact® Strip  
Micro reagent delivery system.

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Visit us online at [sensafe.com/micro10](http://sensafe.com/micro10) for up-to-date  
product information & NEW tests available.

To prevent warranty issues, you must register your  
ownership within 30 days of purchase and include the serial  
number (on bottom of Micro 10 Meter) and valid e-mail  
address. Visit our website [sensafe.com/micro10](http://sensafe.com/micro10) to register.  
By registering, your 2-year warranty is activated and you  
will be updated when needed regarding the Micro 10.

**Manufactured By:** Industrial Test Systems, Inc.  
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**Phone:** 1-800-861-9712 - *INSIDE THE U.S.*

1-803-329-9712 - *OUTSIDE THE U.S.*

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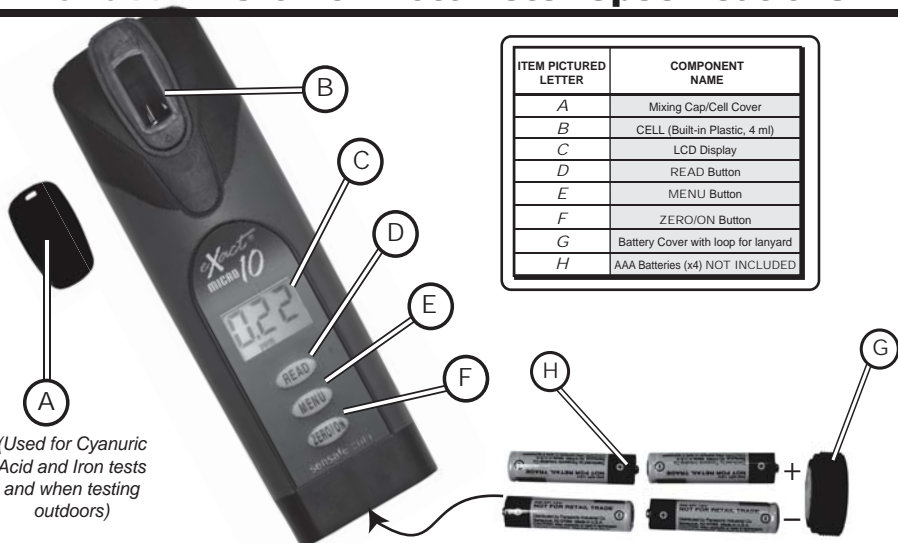


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# eXact® Micro 10 Photometer Specifications



ITEM PICTURED LETTER	COMPONENT NAME
A	Mixing Cap/Cell Cover
B	CELL (Built-in Plastic, 4 ml)
C	LCD Display
D	READ Button
E	MENU Button
F	ZERO/OFF Button
G	Battery Cover with loop for lanyard
H	AAA Batteries (x4) NOT INCLUDED

(Used for Cyanuric Acid and Iron tests and when testing outdoors)

<b>Measurement Method:</b>	Photometric
<b>Light Source:</b>	Light Emitting Diode (LED)
<b>Wavelength:</b>	525 nm
<b>Transmission Equivalent:</b>	100 - 0.00 %T
<b>Photometric Precision:</b>	+/- 0.1/0.01 %T (as transmission)
<b>Automatic Ranging:</b>	Available for Chlorine
<b>Display:</b>	3-digit customized liquid crystal display with annunciators
<b>CELL Pathlength:</b>	20mm

<b>Cell Chamber:</b>	Custom-molded, proprietary, PET plastic fused into chamber, non-removable
<b>Sample Required:</b>	4 ml (0.13 oz)
<b>Operating Temperature Range:</b>	0 - 50°C (32° - 122°F)
<b>Power Supply:</b>	(4) AAA alkaline batteries <b>NOT INCLUDED</b>
<b>Battery Life:</b>	>2000 tests with alkaline batteries
<b>Electromagnetic Compliance: (EMC)</b>	Emitted Interference - EN 61326 Immunity to Interference - EN 61326
<b>Waterproof Rating:</b>	Exceeds IP67
<b>Weight:</b>	Instrument: 140 g (5 oz)
<b>Dimensions:</b>	Instrument: 5 (W) x 3.5 (D) x 16.5 (H) cm; (2 x 1.4 x 6.375 in)

## We offer a “Green” Alternative

eXact® Strip Micro 10 has been designed to offer the user a more “Green” and cost-effective alternative to testing. Instead of using a 10ml water sample, eXact® Strip Micro 10 uses a 4ml water sample, which uses up to 60% less chemical per test. The accuracy of the meter is maintained by designing the photo cell with a 20mm pathlength.

### eXact® Micro 10 Specifications

Menu	Tests for <sup>1</sup>	Range	Resolution	Expected Meter Accuracy (±%) <sup>3</sup>
AL1	Total Alkalinity	5 - 200 ppm	1	12
PH2	pH	6.2 - 8.4 pH	0.1	0.3 pH
CL3	Free, Combined & Total Chlorine and Ozone (DPD-1) & (DPD-3)	0 - 11 ppm	0.01 (0-5.99 ppm)	3 (0.01-3.00 ppm)
			0.1 (6.0-11 ppm)	7 (3.01-5.99 ppm) 14 (6.0-11 ppm)
CL3	Bromine (DPD-1) <sup>2</sup>	0 - 28 ppm	0.01 (0-9.99 ppm)	3 (0.01-8.00 ppm)
			0.1 (10.0-28 ppm)	10 (8.01-18.0 ppm) 12 (18.1-28 ppm)
PO4	Phosphate	0 - 4 ppm	0.01	3 (0.01-3.00 ppm) 7.5 (3.01-4 ppm)
CA5	Calcium Hardness as CaCO <sub>3</sub>	10 - 500 ppm	1	16
CH6	Salt / Chloride as NaCl	40 - 7000 ppm	1	15
CY7	Cyanuric Acid	0 - 110 ppm	0.01 (0-9.99 ppm)	12 (0.01-40.9 ppm)
			1 (10-110 ppm)	13 (41-110 ppm)
CU8	Copper (as Cu <sup>+2</sup> )	0.04 - 8 ppm	0.01 (0.04-2.99 ppm)	3
			0.1 (3.0-8 ppm)	

<sup>1</sup> Performance verified with various salt systems and water samples with optimal water temperature at 10-40°C / 50-104°F. Optimal water temperature for Phosphate test is 15-40°C / 59-104°F.

<sup>2</sup> Bromine is read in CL3 Menu and requires a multiplication factor of 2.6.

<sup>3</sup> For example: If the sample has 1 ppm of Free Chlorine, the meter may read 0.97 ppm or 1.03 ppm.

# About Your eXact® Micro 10 Instrument

In order to save power, the meter is designed to turn off after 3 minutes (timed from the last button pressed). Should the meter turn off in the middle of a test, the last stored zero in the meter will remain valid when the meter is turned on again. All test results, except chlorine, are automatically stored in memory for easy retrieval. The eXact® Micro 10 meter is controlled by three buttons:

1. **ZERO/ON:** When first pressed, this button turns the meter on. When the meter is on and this button is pressed, it zeroes the sample in the cell. Once the meter is zeroed, this zero value applies to all parameters and is stored and retained even when meter turns off. However, it is recommended that each new water sample analyzed is zeroed before testing, to maximize sensitivity and accuracy.
2. **MENU:** With each press, the MENU button advances through the tests in the following sequence: AL1, PH2, CL3, PO4, CA5, CH6, CY7, CU8. Each test menu can store up to 20 results. To **retrieve the stored results**, go to the desired test using the MENU key. When the desired test is displayed, **press and hold down the MENU key**. Continue holding down the MENU key to scroll the stored results for that test, starting with the most recent result. The meter will display, from memory, the last 20 readings in sequence beginning with -20, which is the latest result, followed by -19, which is the 2<sup>nd</sup> latest result, etc; and finally -01, which is the oldest result retained. Only the last 20 readings are stored in each menu. This meter is able to store 160 results in memory (20 in each menu).
3. **READ:** When pressed once, this button starts the timer for the parameter being tested. When pressed a second time the meter exits the timer and immediately prepares to colorimetrically measure the sample, and simultaneously stores the measurement in memory.

If the parameter being measured is below or above the detection range, the display will show "LO" (Under Range) or "HI" (Over Range), respectively. This feature is menu specific and does not apply to all parameters.

## About The Accuracy/Calibration of The Micro 10 System

All tests have been calibrated using certified reference standards and standard analytical spectrophotometric methods. The algorithms in the software reflect the best correlation of the eXact® Micro 10 Systems against the AWWA, US EPA, DIN, and ISO reference test methods for chlorine. Studies show that the eXact® Micro 10 System repeatedly agrees with an EPA Compliant reference method greater than 99% ( $R^2=0.9989$ , 0 - 6.0 ppm - see page 20). The eXact® Micro 10 Advanced Photometric System has been factory calibrated for your convenience. You can expect the fixed calibrations in the meter to be valid for the life of the meter because of the quality, Long-Life LED, the photo cell, and the software as written into the meter. This is why the meter comes with a 2-Year Warranty.

## Compliance Verification for Free and Total Chlorine Testing

This DPD test system is accepted by most health departments because this test is USEPA (DIN Standard 38 408 G4, ISO 7393/2) accepted for testing requirements for Free and Total Chlorine. The Micro 10 meter uses a wavelength of 525nm; and the compliance requirement is that the colorimeter wavelength is between 490 and 530nm. The eXact® Strip Micro CL (DPD-1) uses the same reagents and proportions, and the resulting solution pH is maintained between 6.2 and 6.5 as specified by AWWA (American Water Works Association) method 4500-Cl G. It should be understood that the USEPA does not "approve" commercial DPD delivery systems such as reagent powder pillows, tablets, dispensers, or eXact® Strip DPD delivery devices. The eXact® Strip Micro CL (DPD-1) for Free Chlorine, and the eXact® Strip Micro CL (DPD-3) or the eXact® Strip Micro CL (DPD-4) for Total Chlorine meet your reportable testing requirements because the eXact® Strip Micro CL delivers the same chemicals in identical proportions (see table below); therefore, the system is compliant. Likewise, AWWA proportions are followed as required for Total Chlorine measurements using Potassium Iodide.

Component (Free Chlorine)	AWWA 4500-Cl G	eXact® DPD-1
Anhydrous DPD sulfate	1.5%	1.5%
Anhydrous Na <sub>2</sub> HPO <sub>4</sub>	33.4%	33.4%
Anhydrous KH <sub>2</sub> PO <sub>4</sub> Na <sub>2</sub>	64.0%	64.0%
EDTA	1.1%	1.1%



- 1** REMOVE STRIP  
Remove one (1) **eXact® Strip Micro AL, Part No. 486641** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.



- 2** TURN METER ON  
Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last stored reading in memory.



- 3** SELECT TEST: AL1  
Press and re-press the **MENU** button until the display shows the parameter AL1.



- 4** RINSE AND FILL CELL WITH SAMPLE  
Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.



- 5** ZERO METER\*  
Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. The sample is ready for testing.



- 6** DIP STRIP AND PRESS "READ"  
Dip the **eXact® Strip Micro AL, Part No. 486641** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***. NOTE: For water temperatures above 35°C (hot tubs), remove and discard the strip when the timer displays "10", countdown continues. For the hot water samples, a 10-second dip time is best.



- 7** RECORD RESULT DISPLAYED  
The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is automatically stored in AL1). After testing is completed, rinse cell immediately.

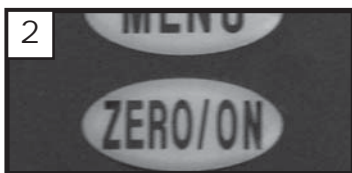
\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.



1

REMOVE STRIP

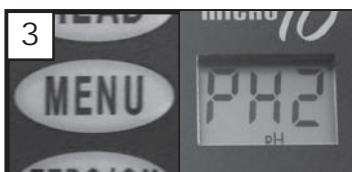
Remove one (1) **eXact® Strip Micro PH, Part No. 486639** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.



2

TURN METER ON

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.



3

SELECT TEST: PH2

Press and re-press the **MENU** button until the display shows the parameter **PH2**.



4

RINSE AND FILL CELL WITH SAMPLE

Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.



5

ZERO METER\*

Press the **ZERO/ON** button. When the display shows **0.0 PH**, the sample is ready for testing.



6

DIP STRIP AND PRESS "READ"

Dip the **eXact® Strip Micro PH, Part No. 486639** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***.



7

READ RESULT DISPLAYED

The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is automatically stored in PH2). After testing, rinse cell immediately.

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

# MENU Free Chlorine/Combined Chlorine Procedure

CL

CL3



**1** REMOVE STRIP  
Remove one (1) **eXact® Strip Micro CL (DPD-1), Part No. 486637** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.



**2** TURN METER ON  
Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.



**3** SELECT TEST: CL3  
Press and re-press the **MENU** button until the display shows the parameter **CL3**.



**4** RINSE AND FILL CELL WITH SAMPLE  
**Rinse the CELL at least 3 times** with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.



**5** ZERO METER\*  
Press the **ZERO/ON** button. The cursor will move across the display followed by **0.00 PPM**. Sample is ready for testing.



**6** DIP STRIP AND PRESS "READ"  
Dip the **eXact® Strip Micro CL (DPD-1), Part No. 486637** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***.



**7** RECORD RESULT DISPLAYED  
The cursor will move across the display while the meter prepares to measure the sample. Record result displayed as Free Chlorine (this result is NOT stored in CL3 unless steps 8,9,10 are completed). If "LO" is displayed, Chlorine is below detection limit.

**DO NOT** discard the sample from the Free Chlorine test, proceed immediately to step 8.

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

Continued from previous page



8

### RE-ZERO METER

Press the **ZERO/ON** button, the display will immediately read **0 PPM**.



9

### REMOVE STRIP

Remove one (1) **eXact® Strip Micro CL (DPD-3), Part No. 486638** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.



10

### DIP STRIP AND PRESS "READ"

Dip the **eXact® Strip Micro CL (DPD-3)** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears.**



11

### RECORD RESULT DISPLAYED

The cursor will move across the display while the meter prepares to measure the sample. Record result displayed as Combined Chlorine (this result, and the Free Chlorine result, are automatically stored in CL3 memory). The sum of Free Chlorine and Combined Chlorine will equal Total Chlorine. **NOTE:** If you press READ again, the meter will do a 20 second countdown and will display the Total Chlorine result (this value will not be stored in memory). After testing is completed, rinse cell immediately and press MENU to select next test.

eXact® Strip Micro CL (DPD-1/DPD-3/DPD-4) Interferences (part nos. 486637/486638/486670)

Interfering Substance	Interfering Levels & Treatments
Acidity	If sample has acidity above 150mg/L CaCO <sub>3</sub> test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sodium hydroxide.
Alkalinity	If sample has alkalinity above 200mg/L CaCO <sub>3</sub> test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sulfuric acid.
Bromine & Bromamines, Br <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Chlorine Dioxide, ClO <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Copper, Cu <sup>+2</sup>	Color development is reduced above 10 ppm (mg/L).
Iodine, I <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Manganese, oxidized (Mn <sup>+4</sup> , Mn <sup>+7</sup> ) or Chromium, oxidized (Cr <sup>+6</sup> )	See AWWA procedure 4500-CL F, 1(d) for removal of interferences.
Monochloramines (NH <sub>2</sub> Cl) (applies to DPD-1 only)	Monochloramine interferences are known to occur in free chlorine DPD methods. This interference is dependent on temperature and monochloramine concentration.
Ozone, O <sub>3</sub>	Color similar to free chlorine reaction at all levels.
Peroxides	Interference is possible.
pH	Typical pH samples of potable water with a pH of 6.0 to 9.0 are OK. If outside this range adjust to pH 6.0 to 7.0 using acid (0.5N Sulfuric acid) or base (0.5N Sodium hydroxide).

**MENU**

# Bromine (DPD-1) Test Procedure

**CL****CL3**

- 1 **REMOVE STRIP**  
Remove one (1) **eXact® Strip Micro CL (DPD-1), Part No. 486637** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.
- 2 **TURN METER ON**  
Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading stored in memory.
- 3 **SELECT TEST: CL3**  
Press and re-press the **MENU** button until the display shows the parameter CL3.
- 4 **FILL METER WITH SAMPLE**  
Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.
- 5 **ZERO METER\***  
Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. The sample is ready for testing.
- 6 **DIP STRIP AND PRESS "READ"**  
Dip the **eXact® Strip Micro CL (DPD-1), Part No. 486637** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***. The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is NOT stored in CL3 memory). After testing is completed, rinse cell immediately and press MENU to select next test.

**NOTE:** Bromine result is the sum reaction of Bromine and Bromamine. Because the Bromine is measured in the CL3 MENU, you must multiply the Chlorine result, on the display, by 2.6 (example: 2.22 x 2.6 = 5.77).

**MENU**

# Total Chlorine (DPD-4) or Ozone Test Procedure

**CL****CL3**

- 1 **REMOVE STRIP**  
Remove one (1) **eXact® Strip Micro CL (DPD-4 for Total Chlorine or Ozone), Part No. 486670** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.
- 2 **TURN METER ON**  
Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.
- 3 **SELECT TEST: CL3**  
Press and re-press the **MENU** button until the display shows the parameter CL3.
- 4 **FILL METER WITH SAMPLE**  
Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross- contamination from a previous test. Finally, fill cell to capacity with the water sample.
- 5 **ZERO METER\***  
Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. Sample is ready for testing.
- 6 **DIP STRIP AND PRESS "READ"**  
Dip the **eXact® Strip Micro CL (DPD-4), Part No. 486670** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***. The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is NOT stored in CL3 memory). Press ZERO/ON, press READ, and allow meter to perform 20-second countdown and display result. If displayed result is 0.01 or higher, press READ again and allow meter to perform 20-second countdown and display result. Record result displayed as Total Chlorine (this result is not stored in CL3 memory). After testing is completed, rinse cell immediately and press MENU to select next test.

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

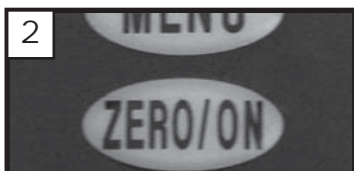




1

REMOVE STRIP

Remove one (1) **eXact® Strip Micro  $\text{PO}_4$ , Part No. 486814** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately. NOTE: Lint or debris from test pad may detach, but will not affect performance.



2

TURN METER ON

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading stored in memory.



3

SELECT TEST: PO4

Press and re-press the **MENU** button until the display shows the parameter **PO4**.



4

RINSE AND FILL CELL WITH SAMPLE

Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample. NOTE: For best results, it is advisable to clean the **CELL** with 0.1N HCl.



5

ZERO METER\*

Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. Sample is ready for testing.



6

DIP STRIP AND PRESS "READ"

Dip the **eXact® Strip Micro  $\text{PO}_4$ , Part No. 486814** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***.



7

RECORD RESULT DISPLAYED

The meter will automatically start to count up for **120 seconds**. After the 120 seconds, the cursor will move across the display while the meter prepares to measure the sample. Record result displayed **as ppm Phosphate** (this result is automatically stored in PO4). After testing is completed, rinse cell immediately. To convert result in ppm to ppb, multiply by 1000 (e.g. **1.21 ppm = 1210 ppb**).

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

**1 REMOVE STRIP**

Remove one (1) **eXact® Strip Micro CA, Part No. 486629** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.

**2 TURN METER ON**

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading stored in memory.

**3 SELECT TEST: CA5**

Press and re-press the **MENU** button until the display shows the parameter **CA5**.

**4 FILL METER WITH SAMPLE**

Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.

**5 ZERO METER\***

Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. The sample is ready for testing.

**6 DIP STRIP AND PRESS "READ"**

Dip the **eXact® Strip Micro CA, Part No. 486629** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***. The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is NOT stored in CA5 memory). After testing is completed, rinse cell immediately and press MENU to select next test.

**1 REMOVE STRIP**

Remove one (1) **eXact® Strip Micro CU, Part No. 486632** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.

**2 TURN METER ON**

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.

**3 SELECT TEST: CU8**

Press and re-press the **MENU** button until the display shows the parameter CU8.

**4 FILL METER WITH SAMPLE**

Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.

**5 ZERO METER\***

Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. Sample is ready for testing.

**6 DIP STRIP AND PRESS "READ"**

Dip the **eXact® Strip Micro CU, Part No. 486632** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip after "1" on the display disappears\***. The display will immediately start counting up from **1 to 120** (this extra time allows more thorough color development). At 120 sec, the cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is automatically stored in CU8). After testing, rinse cell immediately.

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

This test requires a 1:20 (1 to 20) dilution of the salt system sample.



1

**PREPARE SAMPLE FOR TESTING** (using **Mini Dilution Kit II #487202**)  
 Kit includes: Graduated Conical Tube (50ml) with cap; Graduated 3.0ml Syringe (increments of 0.1ml). **Distilled or Deionized (salt-free) water (not supplied) is required** to complete this test.

**How to do 1:20 dilution using Mini Dilution Kit II for Micro 10 (MENU CH6)**

1. Rinse syringe three times with salt system sample that you are about to test by moving plunger up and down.
1. Rinse 50ml graduated conical tube with distilled or deionized (salt-free) water.
2. Rinse the 3.0ml syringe with water sample to be tested. Finally, fill the 3.0ml syringe to the 2.0ml line (plunger ring should line up at the 2.0ml line and little or no air bubble should be present).
3. Add the syringe content (2.0ml salt system sample) to clean 50ml graduated conical tube by pushing plunger all the way down to expel sample.
4. Now, fill the graduated conical tube to the 40ml line with distilled or deionized (salt-free) water. Cap graduated conical tube.
5. Mix content of graduated conical tube by turning up side down at least three times. 1:20 Dilution Sample is ready for testing.



2

**REMOVE STRIP**  
 Remove one (1) **eXact® Strip Micro Chloride II, Part No. 481657-II** from the bottle before beginning the test. Set the strip in a dry, convenient place and recap the bottle immediately.



3

**TURN METER ON**  
 Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.



4

**SELECT TEST: CH6**  
 Press and re-press the **MENU** button until the display shows the parameter **CH6**.



5

**RINSE AND FILL CELL WITH SAMPLE**  
 Using the 1:20 Dilution Sample prepared above, **rinse the CELL 3 times**. Then, fill the **CELL** to capacity with the 1:20 Dilution Sample.



6

**ZERO METER\***  
 Press the **ZERO/ON** button. The cursor will move across the display, followed by **0 PPM**. Meter is ready for testing.



7

**DIP STRIP AND PRESS "READ"**  
 Dip the **eXact® Strip Micro Chloride II, Part No. 481657-II** into the **CELL** and immediately press **READ**. This starts the 20 SECOND countdown timer. During this time move the strip in a gentle back and forth motion (approx. 2 strokes/sec). **Remove and discard the strip when "1" on the display disappears\***.



8

**RECORD RESULT DISPLAYED**  
 The cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is automatically stored in CH6). After testing is completed, rinse cell immediately.

\*NOTE: When testing outdoors (sunlight), for best accuracy, use the Mixing Cap/Cell Cover when Zeroing and Reading the sample.

NOTE: The display only gives you three digits. A "0" should be added to the end of the reading. This is equivalent to multiplying by 10. As an example "213" equals 2,130 ppm as Sodium Chloride (NaCl).

1

TURN METER ON

Press the **ZERO/ON** button to power the meter on; the display will show all annunciators, then the current MENU selection, followed by the last reading.

2

SELECT TEST: CY7

Press and re-press the **MENU** button until the display shows the parameter CY7.

3

RINSE AND FILL CELL WITH SAMPLE

Rinse the **CELL** at least 3 times with the water sample you will be testing - rinsing minimizes the potential for cross-contamination from a previous test. Finally, fill cell to capacity with the water sample.

4

ZERO METER\*

Press the **ZERO/ON** button. The cursor will move across the display, followed by **0.00 PPM**. Tilt the meter to discard about 0.2mL of water sample in order to leave room for liquid reagent.

5

ADD REAGENT AND CAP

Shake the bottle of **eXact® Reagent CY II, Part No. 481652-II** to mix the suspension in the bottle. Then, add five (5) drops of eXact® Reagent CY to the cell and cap meter cell with mixing cap.

6

PRESS "READ" AND MIX

Press **READ** to start timer, place thumb or finger over cap, and mix the sample by turning the meter upside-down repetitively during the **20 SECOND** countdown. NOTE: Cover the cap completely and hold firmly.

7

RECORD RESULT DISPLAYED

**When timer displays 1**, place meter on flat surface (upright) and the meter begins a 60 second count up timing, at the end of which, the cursor will move across the display while the meter prepares to measure the sample. Record result displayed (this result is automatically stored in CY7). After testing is completed, rinse cell immediately and use brush to remove any residual from previous test.

\*NOTE: To obtain optimal accuracy when using the meter outdoors, the Mixing Cap/CELL cover must be in place when zeroing and reading the sample.


# eXact® Micro 10 Tips For Best Accuracy

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1. Become familiar with the meter and the different tests by reading the instructions carefully.
2. Our lab testing with the Micro 10 meter has shown that zeroing and measuring of the sample normally does not require any cell cover for accurate results, except in sunlight. To obtain optimal accuracy when testing with the meter outdoors (sunlight), use the Mixing Cap/Cell Cover when zeroing and reading the sample.
3. Observe the dip time (*as required for the test*) for accurate results.
4. Test immediately after filling the **CELL** with water sample when testing for oxidizers such as Chlorine and Bromine (Ozone can be measured in CL3 MENU).
5. Be sure the **CELL** is filled to capacity (4ml), especially for pH and Total Alkalinity.
6. Rinse the **CELL** with clean water immediately after completing each test. Some reagents may stain the CELL if not rinsed shortly after use. Other reagents including Cyanuric Acid, Chloride, and Calcium Hardness may coat the CELL wall. It is recommended, after these tests, to use the Cell Cleaning Brush with water to clean the CELL.
7. Just before testing, rinse the sample **CELL** with the sample water several times to get a representative sample. (*Use deionized or distilled water for rinsing if you have a limited amount of sample*).
8. Store the meter and all test materials out of direct sunlight and away from chemical storage areas.
9. Minimize exposure of meter and test reagents to heat above 38°C (100°F).
10. Dry the outside of the meter when testing is complete or before storage of the meter.
11. When running a DPD-1 Free Chlorine test **AFTER** a Total Chlorine or Combined Chlorine DPD-3 or DPD-4 test, rinsing is very important to remove residual KI, which may interfere.
12. Each eXact® Strip Micro is valid for **ONLY** one test. Discard strip after single use in regular refuse that is inaccessible to children and pets.
13. Each bottle of eXact® Strip Micro contains the quantity of strips notated on the bottle. Due to the strip slitting process, you may find one or two strips that are noticeably smaller or larger in width than the normal strips in the bottle. These should be discarded. Using these strips may give unreliable results.
14. Each table supplied has a unique revision number located in the bottom right corner of the table. It is recommended that you visit [www.sensafe.com](http://www.sensafe.com) at least every 6 months to check for any updated revisions.
15. Laboratory tests are carried with the sample temperature between 20 and 25°C. The studies also carried for other temperatures for performance verification.
16. The eXact® Micro 10 Meter is not compatible for use with DPD-1, DPD-3, and DPD-4 powder pillows, tablets, and liquids available from other manufacturers. Accurate results can only be guaranteed by using genuine eXact® Micro strips or reagents (*reorder information on page 19*).
17. The Free Chlorine, Combined Chlorine, and Total Chlorine reagents are compliant for meeting USEPA (4500-Cl G); ISO 7393/2; and German DIN 38408 G4-2 requirements.
18. Remove batteries when meter is not used for more than a month (Warranty Requirement).
19. It is recommended that Pool and Spa samples for oxidizers (such as Chlorine) be taken 18 inches below the surface as follows: submerge meter with open cell facing down 18 inches, and then turn meter upright at that depth to fill the cell. Remove meter from water with the sample for testing.
20. The Calcium test uses the Oxalic acid precipitation method. This test is most accurate when the pool water sample is within APSP recommended ranges for pH (7.2-7.8) and alkalinity (80-130ppm). For best results, confirm that the pH and total alkalinity are in the proper ranges before running the Calcium test.

## eXact® Micro 10 Meter Messages

The following are some common messages that may be displayed, including error messages.

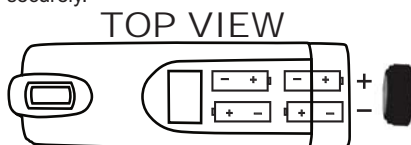
LCD Message	Description	Corrective Action
HI	In READ mode: test sample concentration is above the measurement range (test specific).	Dilute and retest.
LO	In READ mode: test sample concentration is below the measurement range (test specific).	Sample value is below measurement range.
LO	In ZERO mode: sample absorbance (due to a cloudy or colored sample or a dirty cell) is too high to zero, the meter will read "LO".	Dilute sample, filter sample, or clean cell. One of these options should remedy the problem.
ER	Excessive stray light detected. Normally this does not occur, even when testing in sunlight.	Place the LIGHT BLOCKING CAP over the CELL for zeroing and for reading result. Moving to a shaded area can also fix this problem.
	Low battery indication.	Replace the batteries.
TR9	Quality control of meter used by ITS.	Unscrew and rescrew battery cover to reset.
CL5	Clear memory. Contact ITS for more info.	Unscrew and rescrew battery cover to reset.

## About The Built-In Cell

The built-in **CELL** is transparent plastic and, when filled to the top, contains 4ml. The sturdy **CELL** design will last for over 20,000 readings. Scratches on the **CELL** will not interfere or compromise the accuracy of the readings because of its fixed position. For best accuracy, rinse cell with clean water immediately after a test is completed. **Do not use solvents, such as acetone, to clean the cell.** When the **CELL** becomes stained or cloudy from repeated testing, or when the meter does not blank when you press the **ZERO/ON** button, the cell needs to be cleaned. Clean as follows: Fill cell with clean water and move the **Cell cleaning brush** up-and-down and back-and-forth along the walls of the cell. Afterwards, rinse the cell and the meter is ready for use. Cleaning the cell monthly is recommended. If you run turbidity / precipitation chemistries (Chloride, Cyanuric Acid and Calcium) often then clean the cell more frequently.

## To Install/Replace "AAA" Batteries:

1. Unscrew the O-ring sealed battery cover counter-clockwise. Use proper sized pliers if necessary. Do not disturb the sealing O-ring.
2. Remove the old batteries and install 4 new AAA high quality alkaline batteries using the diagram below for correct polarity.
4. Replace the battery cover. Be sure to tighten the cover securely. This is necessary for meter to be waterproof.
5. Dispose of the used batteries in accordance with your local regulations.
6. Press ZERO/ON button to confirm the meter turns on. The meter is now ready for operation.
7. Meter will not work if battery orientation is incorrect.



## eXact® Photometer 2-Year Limited Warranty

Registration of your eXact® photometer must be received within 30 days from date of purchase to activate the warranty. The eXact® photometer is warranted to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase by the customer. ITS will repair or replace, at its discretion, product which is deemed to be faulty due to manufacturing defect. Warranty does not cover product damage caused by abuse (such as crushing a tablet in the cell), battery corrosion damage, or improper use. If the meter is faulty or otherwise defective contact ITS by phone (+1-803-329-9712 Ext. 0) or email (its@sensafe.com) to describe the problem and obtain a return authorization form before returning the photometer to ITS. Damage caused by improper packing of the photometer for return shipment to ITS will not be covered by the warranty. Customer is responsible for shipping charges to ITS. ITS pays postage when photometer is returned to customer. A maximum processing fee of \$75 will be charged for repair or replacement of non-registered photometers and damages not covered by this warranty. Registration is available over the phone (+1-803-329-9712 Ext. 0) or online at <http://www.sensafe.com/micro/warranty/> (Personal data is kept confidential). The repair or replacement of the photometer will not extend or renew the period of guarantee. This warranty does not affect your statutory rights. The warranty is not transferable.

# eXact® Strip Micro 10 Reagent Reorder Information

## eXact® Strip Micro (4mL) Reagent Specifications - For use with eXact® Micro 10, Part no. 486699

No.	PARAMETER	PART NO.	# OF TESTS	DETECTION RANGE	CHEMISTRY
	eXact® Micro Carrying Case w/ foam	486001	N/A	N/A	N/A
	Mini Dilution Kit II	487202	N/A	N/A	N/A
	Reference Standard	486602	15	N/A	N/A
1	Alkalinity, Total	486641	100	5 - 200 ppm	Alizarin Red S + Citrate
2	Bromine (DPD-1)	486637	100	0 - 28 ppm	DPD
3	Calcium (as CaCO <sub>3</sub> )	486629	50	10 - 500 ppm	Oxalic Acid + Buffer
4	Chloride II (as NaCl)	481657-II	25	40 - 7000 ppm	Silver (ppt)
5	Chlorine, Free (DPD-1)	486637	100	0 - 11 ppm	DPD
	Chlorine, Free (DPD-1)	484051	100 Foils	0 - 11 ppm	DPD
6	Chlorine, Combined (DPD-3)*	486638	100	0 - 11 ppm	KI
7	Chlorine, Total (DPD-4)	486670	100	0 - 11 ppm	DPD + KI
	Chlorine, Total (DPD-4)	484054	100 Foils	0 - 11 ppm	DPD + KI
8	Cyanuric Acid II	481652-II	60	0 - 110 ppm	Melamine (ppt)
9	Ozone (DPD-4)	486670	100	0 - 11 ppm	DPD + KI
10	pH	486639	100	6.2 - 8.4 pH	Phenol Red
11	Phosphate	486814	50	0 - 4 ppm	Molybdate Method
12	Copper (Cu <sup>+2</sup> )	486632	50	0.04 - 8 ppm	Biquinoline

\*Combined Chlorine DPD-3 Test requires Free Chlorine DPD-1 (486637) to be run first.

When there is a question about the quality of a ReagentStrip™, your test method, or the photometer you are using, then it is recommended to test the SYSTEM (reagent, you, and photometer) by using the appropriate READY SNAP™ solution.

Follow the procedure for the test you are running. If you get the acceptable result using the READY SNAP™ solution, then you can be confident that the reagent, you, and the photometer are working as a SYSTEM correctly.

<b>eXact® Micro 10 ASSIGNED VALUE FOR READY SNAP® 3</b>		
<b>READY SNAP® 3</b>	<b>FREE CHLORINE DESIRED VALUE</b>	<b>FREE CHLORINE ACCEPTABLE RANGE</b>
Red dye # 505	1.52 ppm	1.46 – 1.59 ppm
Red dye # 22515	1.13 ppm	1.08 - 1.18

NOTE: Values reflect current concentrations as found at time of manufacture and may change with consecutive lots.

R031517

The eXact® Micro 10 Meter is not compatible for use with DPD-1, DPD-3, and DPD-4 powder pillows, tablets, and liquids available from other manufacturers. Accurate results can only be guaranteed by using genuine eXact® Micro strips or reagents.

**If your required procedure/table is not listed in this manual, please see the back page to contact us about it.**

To ensure optimal performance, store your eXact® kit in a cool, dry place away from excess heat (below 38°C / 100°F), moisture, and oxidizers such as Chlorine and Bromine.

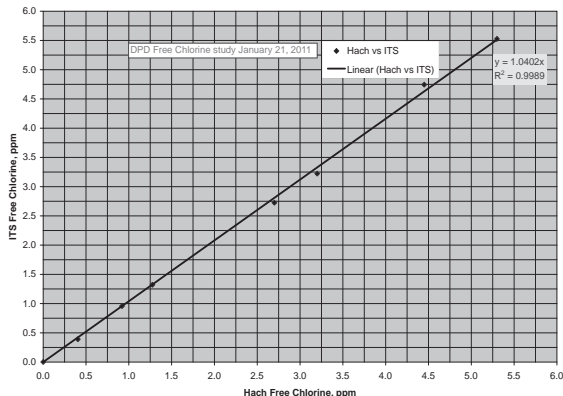
# eXact® Strip Micro DPD-1 Accuracy

Free Chlorine results are compared using the **eXact® Strip Micro CL (DPD-1)** with the eXact® Micro 10 Meter in Menu CL3 and Hach® DR890 Colorimeter in Program 9 and Program 12 using Hach® powder pillows.

DR890	Micro 10
0.00	0.00
0.41	0.39
0.92	0.96
0.79	0.73
1.28	1.32
2.70	2.73
3.20	3.22
4.45	4.75
5.30	5.53

Meter	Menu	Range (PPM)	Resolution
Micro 10	CL3	0.00 to 9.99	0.01
		10.0 to 11.0	0.1
DR890	Program 9	0.00 to 2.20	0.01
	Program 12	0.0 to 11.0	0.1

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## The eXact® Micro 10 Kits

(486699-K)

### Standard Kit Includes:

- 1 eXact® Micro 10 Meter (486699)
- eXact® Strip Micro DPD-1 (486637-25)
- eXact® Strip Micro DPD-3 (486638-25)
- eXact® Strip Micro pH (486639-25)
- eXact® Strip Micro Total Alkalinity (486641-II-25)
- eXact® Strip Micro Calcium Hardness (486629-25)
- eXact® Strip Micro Chloride (Salt) (481657-II)
- eXact® Strip Micro Copper (486632-25)
- eXact® Reagent Cyanuric Acid II (481652-II)
- eXact® Micro Phosphate (486814)
- Mini Dilution Kit II (487202)
- Mixing Cap
- Cell Cleaning Brush
- This Instruction Booklet
- Plastic Carrying Case

(486699-KS)

### Starter Kit Includes:

- 1 eXact® Micro 10 Meter (486699)
- eXact® Strip Micro DPD-1 (486637-25)
- eXact® Strip Micro DPD-3 (486638-25)
- eXact® Strip Micro pH (486639-25)
- eXact® Strip Micro Total Alkalinity (486641-II-25)
- eXact® Reagent Cyanuric Acid (481652-II)
- Mixing Cap
- Cell Cleaning Brush
- This Instruction Booklet
- Small Plastic Carrying Case

**FREE for a limited time with your Micro 10 Kits, Ready Snap 1P samples and Instruction Sheet so you can immediately verify kit performance.**

## Contact Information

### Manufactured By:

Industrial Test Systems, Inc.  
 1875 Langston Street,  
 Rock Hill, SC 29730 USA  
**Phone:** 1-800-861-9712 - *INSIDE THE U.S.*  
 1-803-329-9712 - *OUTSIDE THE U.S.*  
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