



## HYDROPONICS TEST KIT

**MODEL HP-1**

**CODE 3561**

<b>QUANTITY</b>	<b>CONTENTS</b>	<b>CODE</b>
120 mL	*Mixed Acid Reagent	*V-6278-J
5 g	*Nitrate Reducing Reagent	*V-6279-C
60 mL	*VM Phosphate	*4410-H
30 mL	*Wide Range Indicator	*2218-G
30 mL	*Sodium Hydroxide, 1.0N	*4004WT-G
60 mL	*Hydrochloric Acid, 1.0N	*6130WT-H
15 mL	*Sodium Hydroxide Reagent w/Metal Inhibitors	*4259-E
5 g	*Tetraphenylboron Powder	*6364-C
6	Test Tubes, plastic, w/cap	0106
1	Double Tube, potassium, w/cap	0780
1	Spoon, 0.1 g, plastic	0699
1	Spoon, 0.05 g, plastic	0696
1	Pipet, 1.0 mL	0354
1	Test Tube Brush	0514
1	Demineralizer Bottle	1152
1	Octa-Slide Viewer	1100
1	pH Wide Range Octa-Slide Bar, 4.5-8.0	3424
1	Phosphorus Octa-Slide Bar, 3.0-30 ppm	3426
1	Nitrate Octa-Slide Bar, 0.25-10.0 ppm	3413
1	Plant Nutrition Studies	1596
1	Graduated Cylinder, 25 mL	0417
1	Dispenser Cap	0692

**\*WARNING:** Reagents marked with a \* are considered hazardous substances. Material Safety Data Sheets (MSDS) are supplied for these reagents. For your safety read label and accompanying MSDS before using.

To order individual reagents or test kit components, use the specified code number.

Read Demineralizer Bottle instruction manual before proceeding.

The Demineralizer Bottle (1152) will be the source of all deionized water used in these tests.

## DILUTION PROCEDURE

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If the test result in the nitrate, phosphate or potassium test is greater than the highest value it is necessary to perform a dilution. Use the 1.0 mL pipet (0354) and the 25 mL graduated cylinder (0417) as follows:

AMOUNT OF SAMPLE	DILUTE TO	MULTIPLY RESULT BY
1.0 mL	5.0 mL	5
1.0 mL	10.0 mL	10
1.0 mL	20.0 mL	20
1.0 mL	25.0 mL	25

Use deionized water from the Demineralizer Bottle for all dilutions.

## pH

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A pH value of 7.0 indicates a neutral solution. Values above 7.0 indicate alkaline solutions, while values below pH 7.0 indicate acid solutions.

1. Fill a test tube (0104) to 5 mL line with sample solution.
2. Add 8 drops of \*Wide Range Indicator (2218). Cap and mix.
3. Insert pH Wide Range Octa-Slide (3424) into Octa-Slide Viewer.
4. Insert test tube into the Octa-Slide Viewer (1100). Match sample color to the pH Wide Range Octa-Slide Bar (3424).

**NOTE:** If the pH of the sample is not between 6.2 and 6.8, it must be adjusted to 6.5 before proceeding the with the Nitrate, Phosphorus, and Potassium tests. If the pH is below 6.2 add \*Sodium Hydroxide, 1.0N (4004), one drop at a time, periodically checking the pH until it is brought into the range of 6.2 to 6.8. If the pH is above 6.8, add \*Hydrochloric Acid, 1.0N (6130) in the same manner.

## NITRATE NITROGEN

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The range of the color standards in the Nitrate Nitrogen Color Bar is from 0.25 to 10 ppm Nitrate Nitrogen. If the nutrient solution is above this range, it should be diluted to bring the readings within the range. The dilution will depend upon the amount of nitrate in the solution. A 1 to 20 dilution is suggested.

**NOTE:** Place dispenser cap (0692) on \*mixed Acid Reagent (V-6278). Save this cap for refill reagents.

- 1.** Fill a test tube (0105) to the first line with nutrient solution.
- 2.** Add \*Mixed Acid Reagent (V-6278) to the second line (5.0 mL total). Cap and mix. Wait two minutes.
- 3.** Use the 0.1 g spoon (0699) to add one level measure (avoid any excess) of \*Nitrate Reducing Reagent (V-6279). Cap and invert the tube 50-60 times in one minute. Wait 10 minutes.
- 4.** Insert Nitrate Octa-Slide Bar (3413) into Octa-Slide Viewer (1100).
- 5.** Insert the tube into the Octa-Slide Viewer (1100). Match sample color to a color standard. If the original sample was diluted, multiply the reading by 20 to obtain the final result in ppm Nitrate Nitrogen.

## PHOSPHORUS

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The range of the color standards in the phosphorus comparator is from 3 to 30 ppm Phosphorus. Most nutrient solutions will have to be diluted to bring the reading within this range. A 1 to 2 dilution is suggested and involves diluting 5 mL of solution to 10 mL with deionized water.

- 1.** Fill a test tube (0104) to the line with nutrient sample.
- 2.** Use the 1.0 mL pipet (0354) to add 1.0 mL of \*VM Phosphate (4410). Cap and mix. Wait 5 minutes.
- 3.** Insert Phosphorous Octa-Slide Bar (3246) into Octa-Slide Viewer (1100).
- 4.** Insert test tube into the Octa-Slide Viewer (1100). Match sample color to a color standard. If the original sample was diluted, multiply the reading by 2 to obtain the final result in ppm Phosphorus.

## POTASSIUM

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A turbidimetric method is used for the determination of potassium in the nutrient solution. It is suggested that the nutrient solution be diluted to a 1 to 5 ratio with deionized water to bring the sample concentration within the range of the test. A 1 to 5 dilution involves diluting 2 mL of the sample to 10 mL with deionized water.

1. Remove the square inner tube and collar.
2. Fill the round tube to the first line (8 mL) with nutrient sample.
3. Fill to the second line (16 mL total) with deionized water.
4. Add 2 drops of \*Sodium Hydroxide Reagent (4259). Cap and mix.
5. Use the 0.5 g spoon (0696) to add one level measure of Tetraphenylboron Powder (6364). Cap and shake vigorously until all the powder has dissolved. A white precipitate will form immediately. Wait 5 minutes.
6. Shake the tube again. Remove cap and slowly insert the square tube with the collar. The square tube will slide up and down through the collar and fill with liquid.
7. Viewing from above, adjust the square tube into the turbid solution until the black dot on its base is obscured. Hold the round tube at the top to avoid blocking light.

Record the height of the liquid in the square tube on the scale. Calibrations represent parts per million potassium. If the original sample has been diluted 1 to 5, the reading should be multiplied by 5 to obtain the potassium content of the original sample.

**NOTE:** Brush tubes thoroughly after each use.

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