

## Phosphate HR T

M321

0.33 - 26 mg/L P

Vanadomolybdate

### Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

| Instrument Type                       | Cuvette | $\lambda$ | Measuring Range     |
|---------------------------------------|---------|-----------|---------------------|
| , MD 600, MD 610, MD 640, MultiDirect | ø 24 mm | 430 nm    | 0.33 - 26 mg/L P    |
| SpectroDirect                         | ø 24 mm | 470 nm    | 0.33 - 26 mg/L P    |
| XD 7000, XD 7500                      | ø 24 mm | 470 nm    | 0.33 - 26.09 mg/L P |

### Material

Required material (partly optional):

| Reagents                                  | Packaging Unit | Part Number |
|---|----------------|-------------|
| Set Phosphate No. 1 HR/No. 2 HR 100 Pc. # | 100 each       | 517661BT    |
| Phosphate HR P1                           | Tablet / 100   | 515810BT    |
| Phosphate HR P2                           | Tablet / 100   | 515820BT    |

### Application List

- Waste Water Treatment
- Boiler Water
- Drinking Water Treatment
- Raw Water Treatment



## Preparation

1. Strongly buffered samples or samples with extreme pH values should be adjusted to between pH 6 and pH 7 before the analysis (use 1 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).
2. Ortho-Phosphate ions react with the reagent to form an intense yellow colour. Phosphate, which is found in organic and condensed, inorganic (meta-, pyro- and polyphosphate) forms, must therefore be converted into ortho-phosphate ions prior to analysis. The pretreatment of the sample with acid and heat creates the conditions for the hydrolysis of the condensed, inorganic forms. Organically bound phosphate can be converted into ortho-phosphate ions by heating with acid and Persulphate.  
The amount of organically bound phosphate can be calculated:  
$$\text{mg/L organic Phosphate} = \text{mg/L Phosphate, total} - \text{mg/L Phosphate, can be hydrolysed in acid.}$$

## Notes

1. Only ortho-phosphate ions react.
2. For samples under 5 mg/L  $\text{PO}_4$  it is recommended to analyse the water sample using Method 320 "Phosphate ortho LR with Tablet".



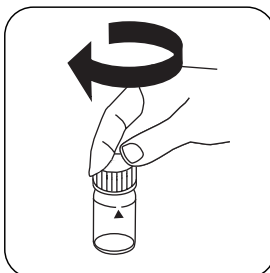
## Determination of Phosphate, ortho HR with Tablet

Select the method on the device.

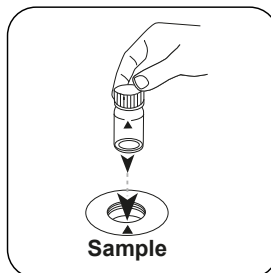
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



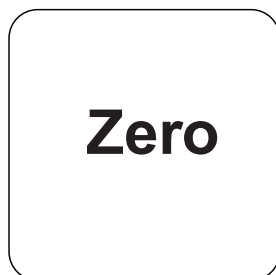
Fill 24 mm vial with **10 mL sample**.



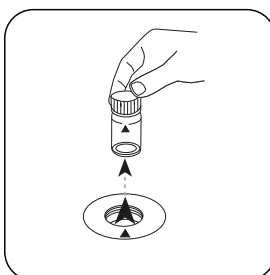
Close vial(s).



Place **sample vial** in the sample chamber. Pay attention to the positioning.

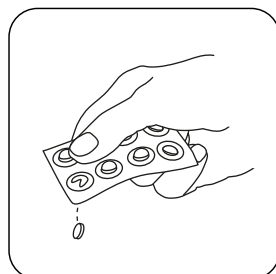


Press the **ZERO** button.

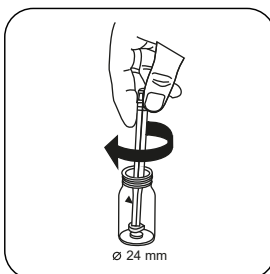


Remove the vial from the sample chamber.

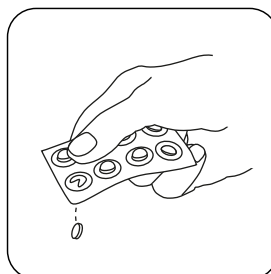
For devices that require **no ZERO measurement**, start here.



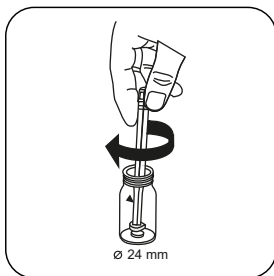
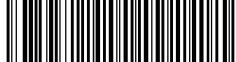
Add **PHOSPHATE HR P1 tablet**.



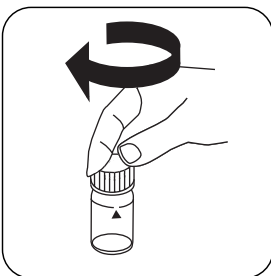
Crush tablet(s) by rotating slightly.



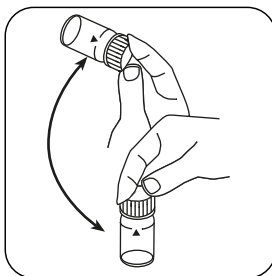
Add **PHOSPHATE HR P2 tablet**.



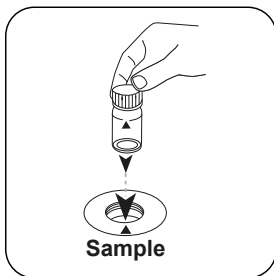
Crush tablet(s) by rotating slightly.



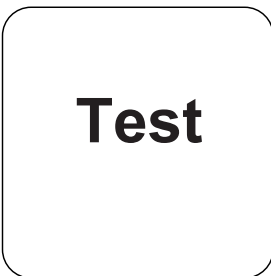
Close vial(s).



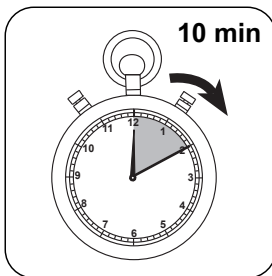
Dissolve tablet(s) by inverting.



Place **sample vial** in the sample chamber. Pay attention to the positioning.

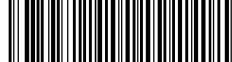


Press the **TEST** (XD: **START**) button.



Wait for **10 minute(s) reaction time**.

Once the reaction period is finished, the measurement takes place automatically.  
The result in mg/L ortho-Phosphate appears on the display.



## Analyses

The following table identifies the output values can be converted into other citation forms.

| Unit | Cite form              | Scale Factor |
|------|------------------------|--------------|
| mg/l | P                      | 1            |
| mg/l | $\text{PO}_4^{3-}$     | 3.0661       |
| mg/l | $\text{P}_2\text{O}_5$ | 2.2913       |

## Chemical Method

Vanadomolybdate

## Appendix

### Calibration function for 3rd-party photometers

Conc. =  $a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$

|   | ø 24 mm                  | □ 10 mm                  |
|---|--------------------------|--------------------------|
| a | $-2.62225 \cdot 10^{+0}$ | $-2.62225 \cdot 10^{+0}$ |
| b | $2.53376 \cdot 10^{+1}$  | $5.44759 \cdot 10^{+1}$  |
| c | $2.7388 \cdot 10^{+0}$   | $1.26601 \cdot 10^{+1}$  |
| d |                          |                          |
| e |                          |                          |
| f |                          |                          |

## Interferences

| Interference         | from / [mg/L]     |
|----------------------|-------------------|
| Al                   | 200               |
| $\text{AsO}_4^{3-}$  | in all quantities |
| Cr                   | 100               |
| Cu                   | 10                |
| Fe                   | 100               |
| Ni                   | 300               |
| $\text{H}_2\text{S}$ | in all quantities |
| $\text{SiO}_2$       | 50                |



| Interference        | from / [mg/L]     |
|---------------------|-------------------|
| Si(OH) <sub>4</sub> | 10                |
| S <sup>2-</sup>     | in all quantities |
| Zn                  | 80                |

**According to**

Standard Method 4500-P E

\* including stirring rod, 10 cm