

## Phosphate VARIO TT

324

0.06 - 5 mg/l P

Phosphomolybdenum Blue

### 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 16 mm | 660 nm    | 0.06 - 5 mg/l P   |
| SpectroDirect, XD 7000, XD 7500     | ø 16 mm | 890 nm    | 0.02 - 1.6 mg/l P |

### Material

Required material (partly optional):

| Reagents             | Packaging Unit | Part Number |
|----------------------|----------------|-------------|
| Phosphate-Ortho, Set | 1 Set          | 535200      |

### Application List

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

### Preperation

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 blue 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:  

$$\text{mg/l organic Phosphate} = \text{mg/l Phosphate, total} - \text{mg/l Phosphate, can be hydrolysed in acid.}$$

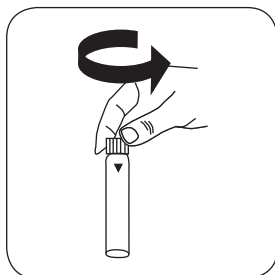
### Notes

1. The reagent is not completely dissolved.

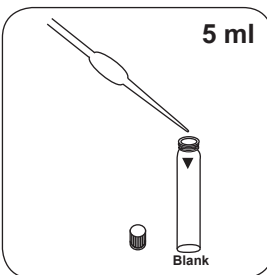
## Implementation of the provision Phosphate, ortho with Vario Vial Test

Select the method on the device

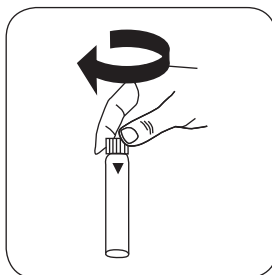
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



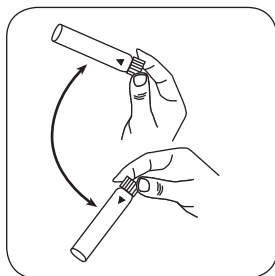
Open **digestion vial**  $\text{PO}_4\text{-P}$  Dilution .



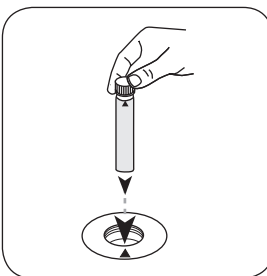
Put **5 ml sample** in the vial.



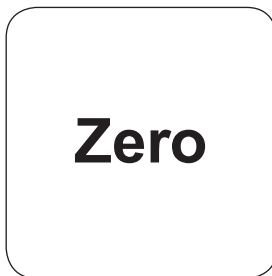
Close vial(s).



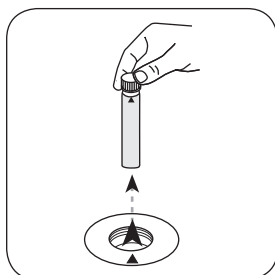
Invert several times to mix the contents.



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

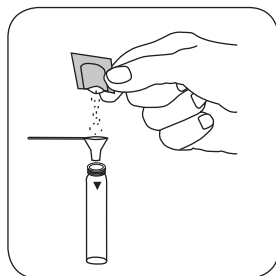


Press the **ZERO** button.

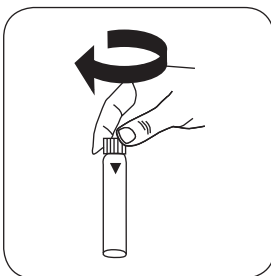


Remove **vial** from the sample chamber.

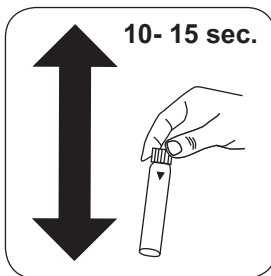
For devices that require **no ZERO measurement** , start here.



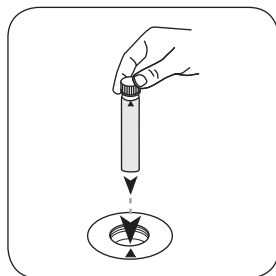
Add **Vario Phosphate Rgt. F10 powder pack**.



Close vial(s).



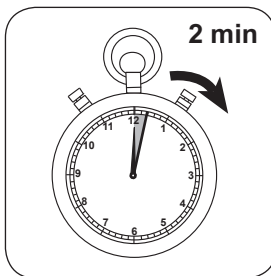
Mix the contents by shaking. (10- 15 sec.).



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



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



Wait for **2 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 | $\text{PO}_4^{3-}$     | 3.066177     |
| mg/l | $\text{P}_2\text{O}_5$ | 2.29137      |

## Chemical Method

Phosphomolybdenum Blue

## Appendix

### Interferences

#### Persistent Interferences

- Large amounts of unresolved solids can cause non-reproducible measurement results.

| 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                |
| $\text{Si}(\text{OH})_4$ | 10                |
| $\text{S}^{2-}$          | in all quantities |
| Zn                       | 80                |

#### According to

DIN ISO 15923-1 D49

Standard Method 4500-P E

<sup>a)</sup> determination of free, combined and total | <sup>b)</sup> Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C) | <sup>c)</sup> MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75) | <sup>d)</sup> Spectroquant® is a Merck KGaA Trademark | <sup>e)</sup> alternative reagent, used instead of DPD No.1/No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity | <sup>f)</sup> additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine | <sup>g)</sup> Reagent recovers most insoluble iron oxides without digestion | <sup>h)</sup> additionally required for samples with hardness values above 300 mg/l  $\text{CaCO}_3$  | <sup>i)</sup> high range by dilution | <sup>j)</sup> including stirring rod, 10 cm