

Phosphate TT

M324

0.02 - 1.63 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	λ	Measuring Range
MD 600, MD 610, MD 640, MultiDirect	ø 16 mm	660 nm	0.02 - 1.63 mg/L P
SpectroDirect, XD 7000, XD 7500	ø 16 mm	890 nm	0.02 - 1.63 mg/L P

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Phosphate-Ortho, Set	1 Set	535200
ValidCheck Phosphate 0.3 mg/l PO ₄ - 4	1 pc.	48241225
ValidCheck Phosphate 1 mg/l PO ₄ - 4	1 pc.	48241425
ValidCheck DW Anions Multistandard Cl/F/NO ₃ /PO ₄ /SO ₄	1 pc.	48399312

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 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

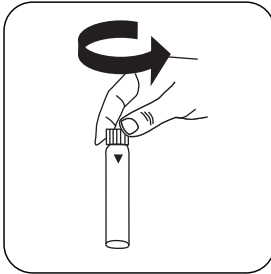
1. The reagent does not dissolve completely.



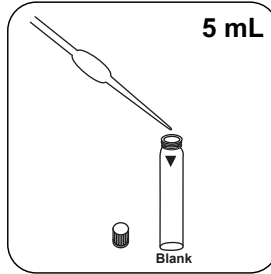
Determination of Phosphate, ortho with Vario Vial Test

Select the method on the device.

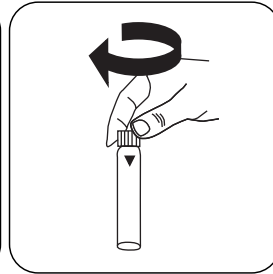
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



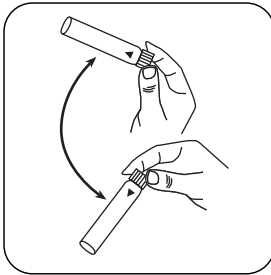
Open **digestion vial Phosphate Dilution**.



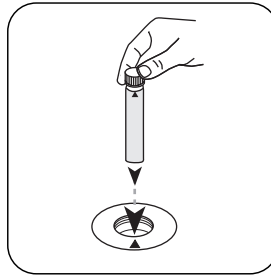
Put **5 mL sample** in the vial.



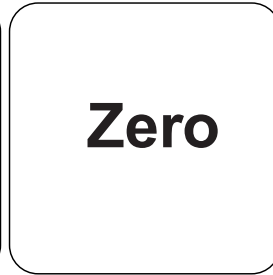
Close vial(s).



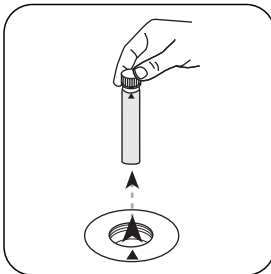
Invert several times to mix the contents.



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

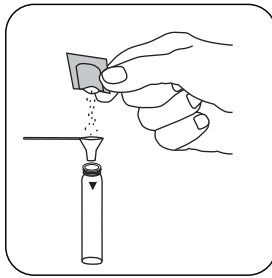


Press the **ZERO** button.

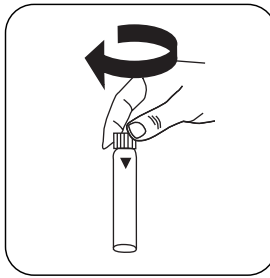


Remove **vial** from the sample chamber.

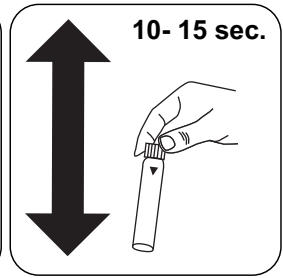
For devices that require **no ZERO measurement**, start here.



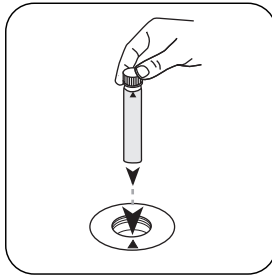
Add **Vario Phosphate Rgt. F10** powder pack.



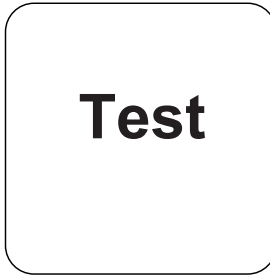
Close vial(s).



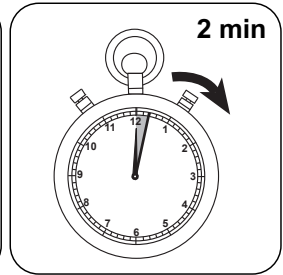
Mix the contents by shaking. (10- 15 sec.).



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	PO ₄ ³⁻	3.0661
mg/l	P ₂ O ₅	2.2913

Chemical Method

Phosphomolybdenum Blue

Appendix

Calibration function for 3rd-party photometers

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


	ø 16 mm
a	2.18629 • 10 ⁻²
b	1.71913 • 10 ⁻⁰
c	
d	
e	
f	

Interferences

Persistent Interferences

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

Interference	from / [mg/L]
Al	200
AsO ₄ ³⁻	in all quantities
Cr	100
Cu	10
Fe	100
Ni	300



Interference	from / [mg/L]
H ₂ S	in all quantities
SiO ₂	50
Si(OH) ₄	10
S ²⁻	in all quantities
Zn	80

According to

DIN ISO 15923-1 D49
Standard Method 4500-P E