Phosphate HR T 321
1 - 80 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	λ	Measuring Range
MD 600, MD 610, MD 640, MultiDirect	ø 24 mm	430 nm	1 - 80 mg/l P
SpectroDirect, XD 7000, XD 7500	ø 24 mm	470 nm	1 - 80 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

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 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:

mg/l organic Phosphate = mg/l Phosphate, total - mg/l Phosphate, can be hydrolysed in acid.

Notes

1. Only ortho-phosphate ions react.
2. For samples under 5 mg/l PO_4 it is recommended to analyse the water sample using Method 320 ”Phosphate ortho LR with Tablet“.

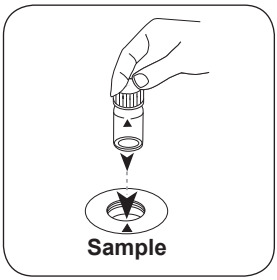
Implementation of the provision Phosphate, ortho HR with Tablet

Select the method on the device

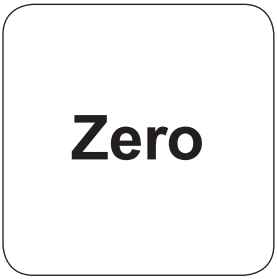
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

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

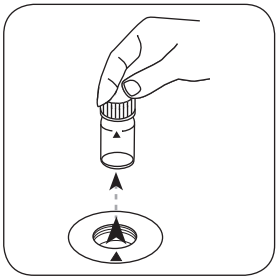
Close vial(s).



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

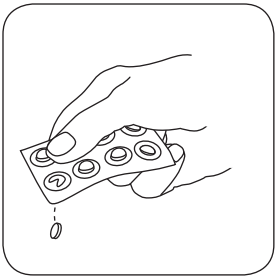


Press the **ZERO** button.

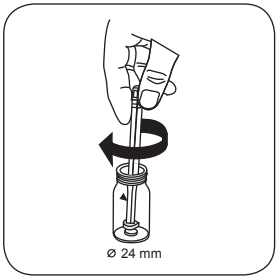


Remove the vial from the sample chamber.

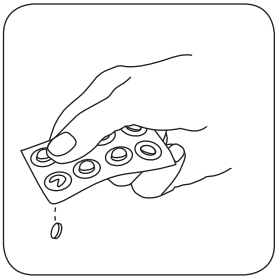
For devices that require **no ZERO measurement** , **start here**.



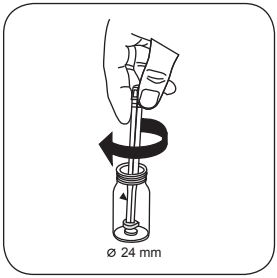
Add **PHOSPHATE HR P1 tablet**.



Crush tablet(s) by rotating slightly.

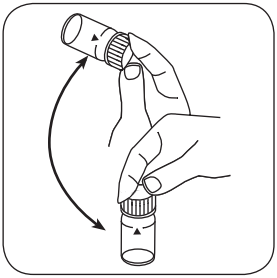


Add **PHOSPHATE HR P2 tablet**.

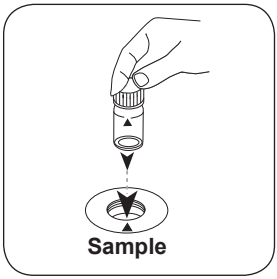


Crush tablet(s) by rotating slightly.

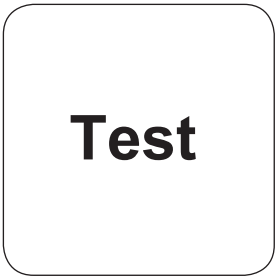
Close vial(s).



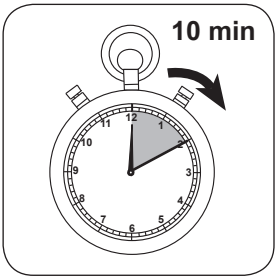
Dissolve tablet(s) by inverting.



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	PO_4^{3-}	3.066177
mg/l	P_2O_5	2.29137

Chemical Method

Vanadomolybdate

Appendix

Interferences

Interference	from / [mg/l]
Al	200
AsO_4^{3-}	in all quantities
Cr	100
Cu	10
Fe	100
Ni	300
H_2S	in all quantities
SiO_2	50
$Si(OH)_4$	10
S^{2-}	in all quantities
Zn	80

Method Validation

Limit of Detection	5.102 mg/l
Limit of Determination	15.307 mg/l
End of Measuring Range	80 mg/l
Sensitivity	0.008 mg/l
Standard Deviation	0.013 µg

According to

Standard Method 4500-P E

[a] determination of free, combined and total | [b] Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C) | [c] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75) | [d] Spectroquant® is a Merck KGaA Trademark | [e] 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 | [f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine | [g] Reagent recovers most insoluble iron oxides without digestion | [h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$ | [i] high range by dilution | [#] including stirring rod, 10 cm