



Phosphate HR L

335

5 - 80 mg/l P

PO4

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 100, MD 110, MD 600, MD 610, MD 640	ø 24 mm	430 nm	5 - 80 mg/l P
XD 7000, XD 7500	ø 24 mm	430 nm	1.63 - 26.09 mg/l P

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Phosphat HR, Ortho Reagent Set	1 pc.	56R019090
KS278-Sulphuric Acid 50 % V/V	65 pc.	56L027865
KS135 Pa1/Alk1-Phenolphthalein Sub-Alk P	65 ml	56L013565
KS144-CH2-FC4-Calcium Hardness Buffer	65 pc.	56L014465
KP962-Ammonium Persulphate Powder	Powder / 40 g	56P096240

The following accessories are required.

Accessory	Packaging Unit	Part Number
Stirring rod and spoon	1 pc.	56A006601

Application List

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

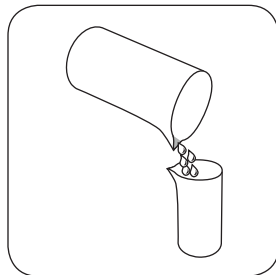
Preparation

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. Prior digestion is required for the analysis of Polyphosphate and total phosphate.

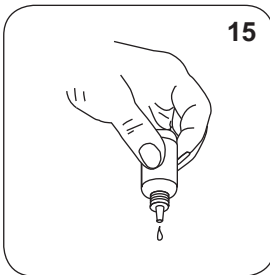
Notes

1. Reagents and accessories available on request.

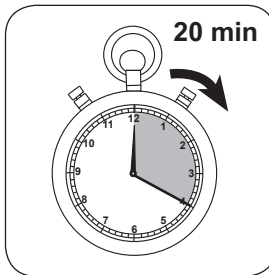
Digestion Polyphosphate HR with liquid reagents



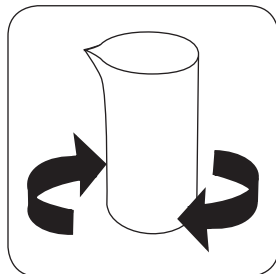
Fill a suitable digestion vessel with **50 ml homogenised sample**.



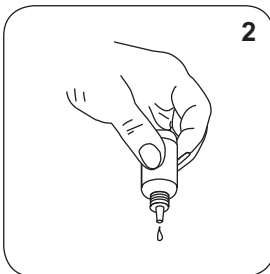
Add **15 drops KS278 (50% sulfuric acid)**.



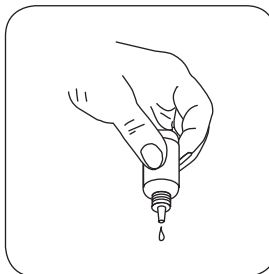
Boil the sample for **20 minutes**. A sample volume of about 25 ml should be retained; If necessary, fill with deionised water.



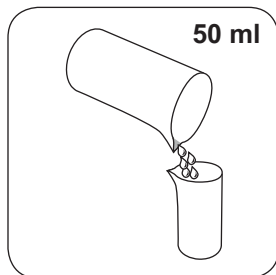
Invert the vial and allow to cool to room temperature.



Add **2 drops KS135 (Phenolphthalein Substitute Indikator)**.

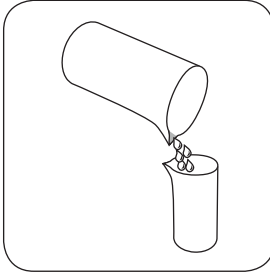


Add **KS 144 (Calcium Hardness Buffer)** drop by drop to the same sample until colouration turns from light pink to red. **(Note: make sure to swirl the vial after adding each drop!)**

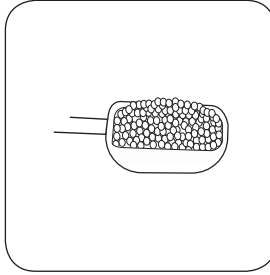


Fill the sample with **deionised water to 50 ml**.

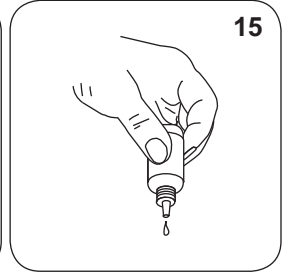
Digestion total Phosphate HR with with liquid reagents



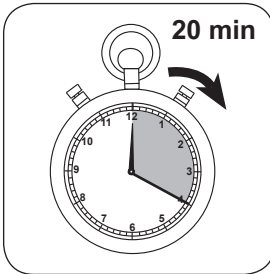
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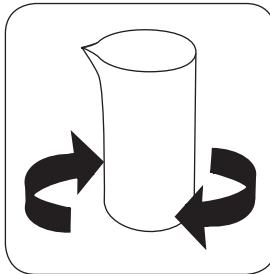
Add a **measuring scoop KP962 (Ammonium Per-sulfate Powder)**.



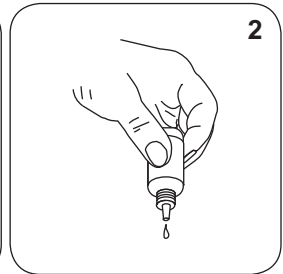
Add **15 drops KS278 (50% sulfuric acid)**.



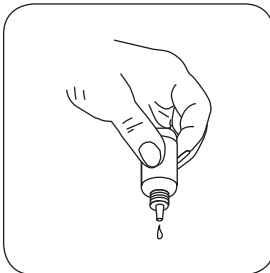
Boil the sample for **20 minutes**. A sample volume of about 25 ml should be retained; if necessary, fill with deionised water.



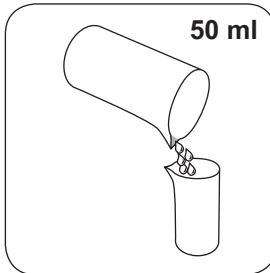
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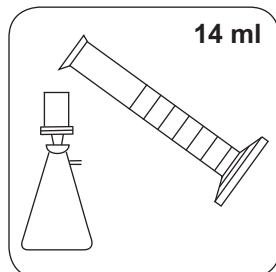


Fill the sample with **deionised water to 50 ml**.

Implementation of the provision Phosphate HR with fluid reagent

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



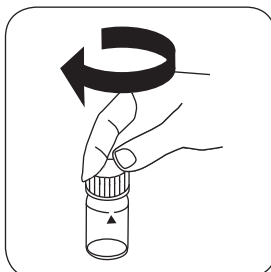
14 ml

Filter approx. 14 ml sample with a pre-rinsed filter (pore size 0.45 µm).

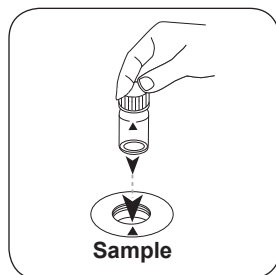


10 ml

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

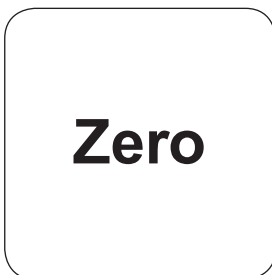


Close vial(s).



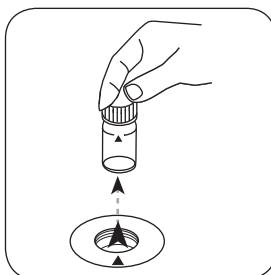
Sample

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



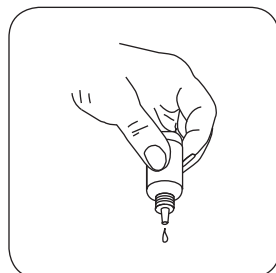
Zero

Press the **ZERO** button.

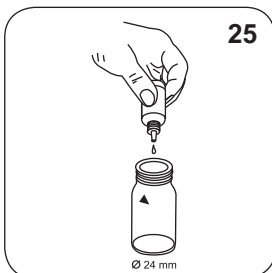


Remove the vial from the sample chamber.

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

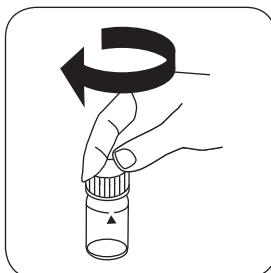


Hold cuvettes vertically and add equal drops by pressing slowly.

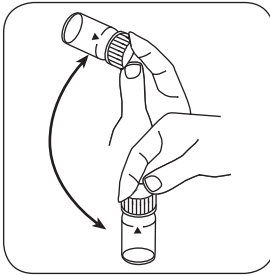


25

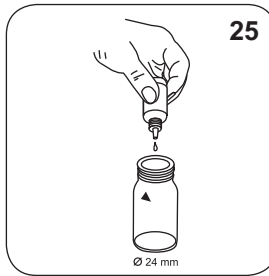
Add **25 drops KS228 (Ammonium Molybdate)**.



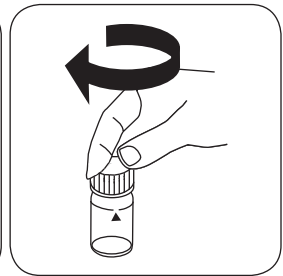
Close vial(s).



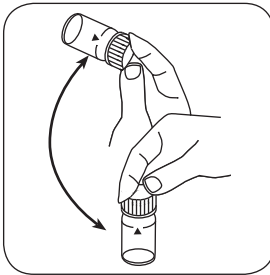
Invert several times to mix the contents.



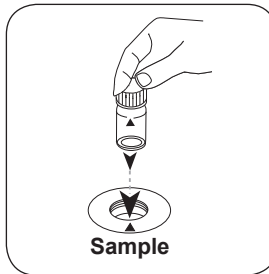
Add **25 drops KS229 (Ammonium Metavanadate)**.



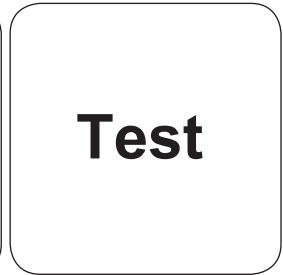
Close vial(s).



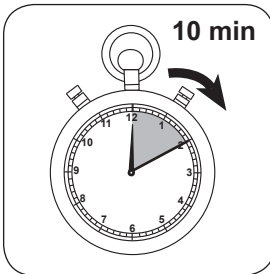
Invert several times to mix the contents.



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 Phosphate appears on the display.

Implementation of the provision Polyphosphate with liquid reagents

Select the method on the device

For testing of **Polyphosphate HR with liquid reagents**, carry out the described **digestion**.

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

This test determines the content of inorganic total phosphate. The Polyphosphate content arises from the difference between inorganic and ortho phosphate.

The test for total Phosphate LR with liquid reagents runs just as the test under Method 335, Phosphate HR with liquid reagents.

The result in mg/l anorganic Total Phosphate (ortho-Phosphate and Polyphosphate) appears on the display.

Implementation of the provision total Phosphate with liquid reagents

Select the method on the device

For testing of **total Phosphate HR with liquid reagents**, carry out the described **digestion**.

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

This test determines all compounds of phosphorus present in the sample, including ortho-phosphate, polyphosphate, and organic phosphorus compounds.

The test for total Phosphate HR with liquid reagent runs just as the test under Method 335, Phosphate HR with liquid reagent.

The result in mg/l total 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 ₂ O ₅	2.29137

Chemical Method

Vanadomolybdate

Appendix

Interferences

Persistent Interferences

- Large amounts of unresolved substances 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
SiO ₂	50
Si(OH) ₄	10
S ²⁻	in all quantities
Zn	80

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 CaCO₃ | ⁱ⁾ high range by dilution | ^{*)} including stirring rod, 10 cm

