



## Phosphate total HR TT

M318

1.5 - 20 mg/L P<sup>b)</sup>

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
SpectroDirect, XD 7000, XD 7500	ø 16 mm	690 nm	1.5 - 20 mg/L P <sup>b)</sup>

### Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Phosphate-total HR/24	24 pc.	2420700

The following accessories are required.

Accessories	Packaging Unit	Part Number
Thermoreactor RD 125	1 pc.	2418940

### Application List

- Waste Water Treatment
- 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

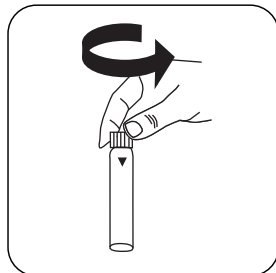
1. If a test is performed without digestion, only ortho-phosphates are recorded.



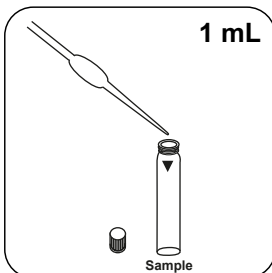
## Determination of Phosphate, total HR with Vial Test

Select the method on the device.

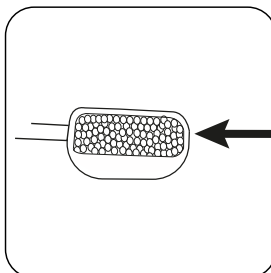
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



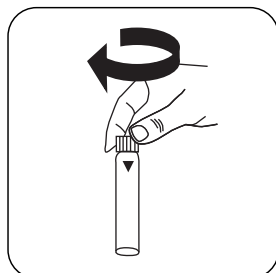
Open **digestion vial** .



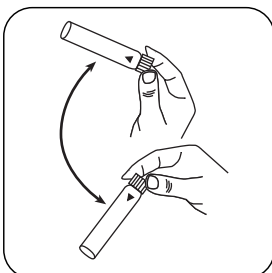
Put **1 mL sample** in the sample vial.



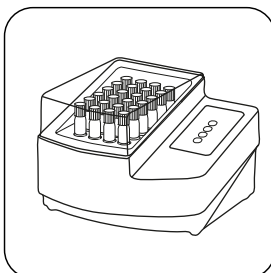
Add a level measuring scoop No. 4 (white) Phosphate-103 .



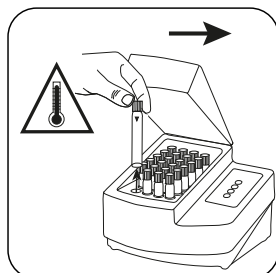
Close vial(s).



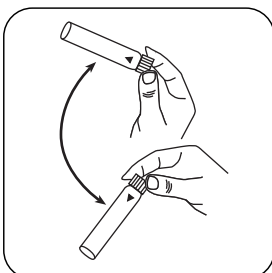
Invert several times to mix the contents.



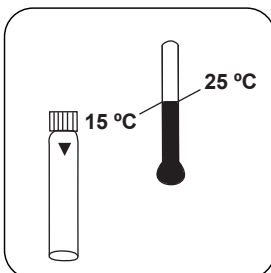
Seal the vials in the pre-heated thermoreactor for **30 minutes at 100 °C** .



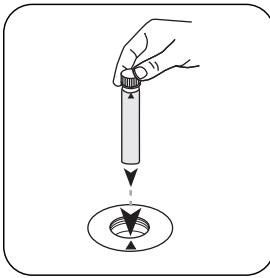
Remove the vial from the thermoreactor. (**Note: vial will be hot!**)



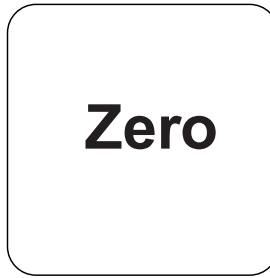
Invert several times to mix the contents.



Allow the vial(s) to cool to room temperature.

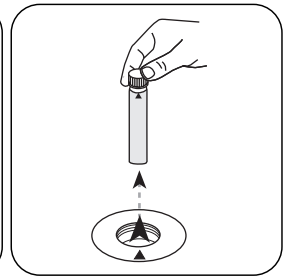


Place the supplied Zero vial (red sticker) in the sample chamber. • Pay attention to the positioning.



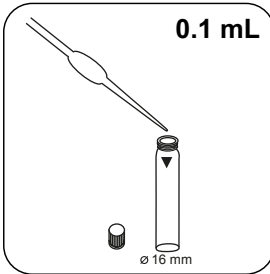
**Zero**

Press the **ZERO** button.

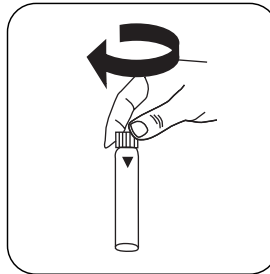


Remove **vial** from the sample chamber.

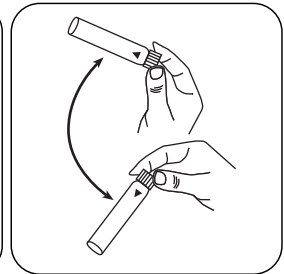
For devices that require **no ZERO measurement** , start here.



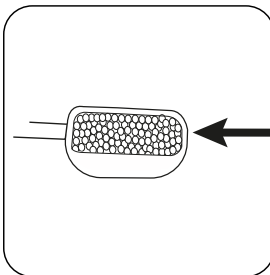
Add **0.1 mL (2 drops) Phosphate-101** to the digested sample.



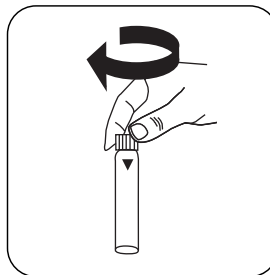
Close vial(s).



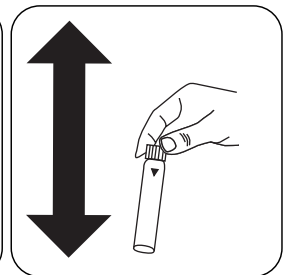
Invert several times to mix the contents.



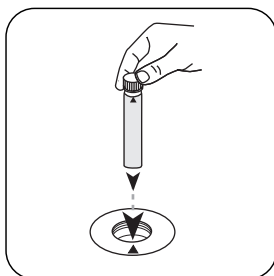
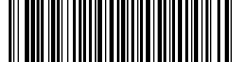
Add a level measuring scoop No. 4 (white) Phosphate-102 .



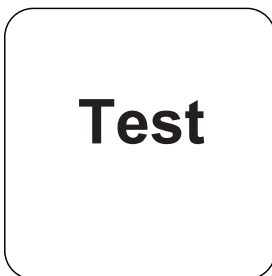
Close vial(s).



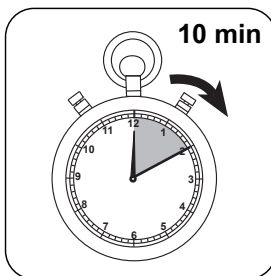
Dissolve the contents by shaking.



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 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 <sub>4</sub> <sup>3-</sup>	3.066177
mg/l	P <sub>2</sub> O <sub>5</sub>	2.29137

## Chemical Method

Phosphomolybdenum Blue

## Appendix

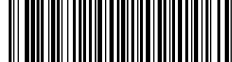
### Calibration function for 3rd-party photometers

Conc. = a + b•Abs + c•Abs<sup>2</sup> + d•Abs<sup>3</sup> + e•Abs<sup>4</sup> + f•Abs<sup>5</sup>

	ø 16 mm
a	-2.31245 • 10 <sup>-1</sup>
b	2.78092 • 10 <sup>+1</sup>
c	4.2385 • 10 <sup>+0</sup>
d	
e	
f	

## Interferences

Interference	from / [mg/L]
Cu <sup>2+</sup>	5
Ni <sup>2+</sup>	25
Pb <sup>2+</sup>	25
Fe <sup>2+</sup>	250
Fe <sup>3+</sup>	250
Hg <sup>2+</sup>	250
Al <sup>3+</sup>	1000
Cr <sup>3+</sup>	1000



<b>Interference</b>	<b>from / [mg/L]</b>
Cd <sup>2+</sup>	1000
Mn <sup>2+</sup>	1000
NH <sub>4</sub> <sup>+</sup>	1000
Zn <sup>2+</sup>	1000
Hardness total	446,5 (2500 °dH)
NO <sub>2</sub> <sup>-</sup>	5
CrO <sub>4</sub> <sup>2-</sup>	30
p-PO <sub>4</sub>	30
S <sup>2-</sup>	30
SiO <sub>2</sub>	30
CN <sup>-</sup>	250
HCO <sub>3</sub> <sup>-</sup>	89,5 mmol/l (250 °dH)
EDTA	250
Cl <sup>-</sup>	1000
NO <sub>3</sub> <sup>-</sup>	1000
SO <sub>4</sub> <sup>2-</sup>	1000
SO <sub>3</sub> <sup>2-</sup>	1000

### According to

DIN ISO 15923-1 D49

Standard Method 4500-P E

US EPA 365.2

<sup>b)</sup> Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)