

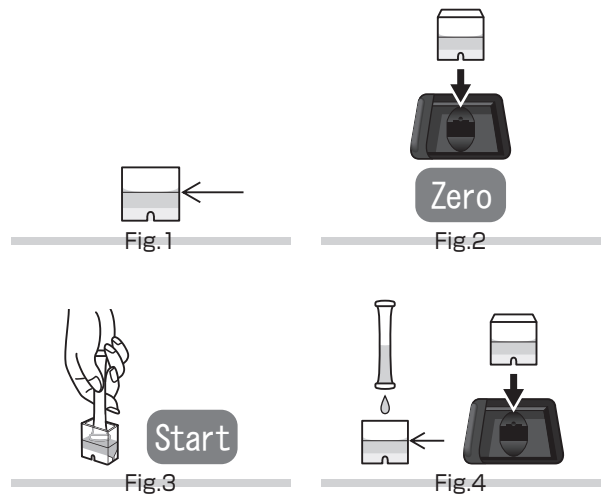
## T-CIO Total Residual Chlorine

Color development: None → Pink  
Method : N,N-diethyl-*p*-phenylenediamine sulfate  
Range : 0.05 — 3.00 mg/L(ppm)  
Reagent : WAK-T·CIO Tube  
Reaction time : 2 min. after drawing sample into the tube.

Cell : PACKTEST Square Cup  
Wavelength : 552 nm, 532 nm, 670 nm

### Procedure

1. Press **[T-CIO]**.
2. Press **[OK]** to switch to the photometry window.
3. Fill the Cell with the sample for 1.5 mL (up to line). (Fig.1)
4. Put the Cell in the cell box and press **[Zero]**. (Fig.2)
5. Suck the whole amount of the sample in the Cell into the tube and press **[Start]** at the same time. (Fig.3)
6. Lightly shake the tube in Step 5 from 5 to 6 times, immediately return the solution in the tube to the Cell in a gentle manner, set it again in the cell box. (Fig.4)
7. After 2 minutes have elapsed, the concentration will be automatically displayed.



### Caution

1. In this method, the concentration of total residual chlorine in the sample is measured.  
To measure the concentration of free residual chlorine (= total residual chlorine - combined residual chlorine), refer to "CIO-DPD Residual Chlorine (Free)".
2. Total residual chlorine is chlorine for disinfection. To measure the concentration of chloride ions ( $\text{Cl}^-$ ) such as common salt, refer to "Cl Chloride".
3. The optimum pH during color development is 7. If the pH of the sample is not within the range from 5 to 9, neutralize the sample with dilute sulfuric acid or dilute sodium hydroxide solution, etc.
4. Perform measurement with the sample temperature set to 15 to 30°C.
5. When the concentration of residual chlorine is 20 mg/L or higher, the measurement value will be low. If high concentration is anticipated, dilute in advance and then perform measurement.

### Influence of coexisting substance

The stored calibration curve has been created by using the standard solution. If the influence of other substance is considered, check the measurement value by comparing it with the official method or by standard addition method.

The right chart is the list of interference data for acceptable level by adding each of the single substances to the standard solution.

Seawater does not affect the measurement.  
Reductive substances such as  $\text{CN}^-$ ,  $\text{Fe}^{2+}$  and  $\text{NO}_2^-$  consume residual chlorine.  
Oxidizing substances cause a positive measurement error.

$\leq 1000\text{mg/L.}$ : $\text{Ca}^{2+}$ , $\text{Cl}^-$ , $\text{F}^-$ , $\text{I}^-$ , $\text{K}^+$ , $\text{Mo (VI)}$ , $\text{Na}^+$ , $\text{Ni}^{2+}$ , $\text{PO}_4^{3-}$ , $\text{SO}_4^{2-}$ , $\text{Zn}^{2+}$
$\leq 500\text{mg/L.}$ : $\text{Al}^{3+}$ , $\text{B (III)}$ , $\text{Cr}^{3+}$ , $\text{Mg}^{2+}$
$\leq 250\text{mg/L.}$ : $\text{Mn}^{2+}$
$\leq 100\text{mg/L.}$ : $\text{NO}_3^-$ , Phenol
$\leq 25\text{mg/L.}$ : $\text{Co}^{2+}$
$\leq 10\text{mg/L.}$ : $\text{Fe}^{3+}$
$\leq 5\text{mg/L.}$ : $\text{Ba}^{2+}$
$\leq 1\text{mg/L.}$ : $\text{Cu}^{2+}$
$< 1\text{mg/L.}$ : $\text{Ag}^+$ , $\text{Cr (VI)}$

### Information on reagent

Refer to the usage that comes with PACKTEST.  
The pH of the solution is about 7.