



Cooling Water/ LPHW/Chilled (Closed System) No.3 Test Kit



Instruction Manual



COOLING WATER No.3

Closed cooling systems are usually treated with high concentrations of inhibitors to prevent pipework corrosion and the build up of scale. A biocide can also be included in treatments to prevent anaerobic bacteria proliferation. Chilled systems often contain glycol as antifreeze and the dose levels should be correctly maintained to prevent water freezing at “cold spots” in the system –see glycol refractometer below.

The Cooling Water/LPHW/Chilled Test Kit 3 contains the following two test that ensure product inhibitor is correctly dosed into the system and that conditions are appropriate to maintain control.

1. Nitrite (oxygen scavenger/corrosion inhibitor)

Nitrite is added to closed cooling systems as an oxygen scavenger. Nitrite will react with any free oxygen to produce nitrate. Removing oxygen helps to prevent corrosion occurring. If nitrite levels are allowed to fall below recommended concentration, pipework corrosion could begin through the system.

2. pH (treatment/bacteria indicator)

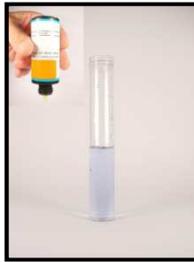
Test strips provided will determine system water pH. Inhibitor treatments contain pH buffers, so any pH measurements outside of the operating range of the treatment could indicate low reserves. Also, a drop in pH reading can be indicative of anaerobic bacteria growth in the system and should be investigated immediately to find the cause.

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Nitrite

Range: 10 – 2000 mg/l (as NaNO₂)

<p>Take sample according to expected range. (See table below)</p> <p>Use a titration jar for larger samples or a test tube for smaller samples (5ml or less)</p>	<p>Add drops of KS171 – N1 (Ferrioin Indicator)</p> <p>According to the sample size taken (See table below). The sample should turn Orange if nitrite is present.</p>	<p>Add drops of KS172 – N2 (Nitrite Titrant)</p> <p>Until the sample changes from Orange to Blue</p>	<p>Record the number of drops added.</p> <p>The colour should remain for at least 10 seconds.</p> <p>Use the jar for samples above 2ml.</p>
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Colours may vary depending on sample and test conditions.

$$\text{Nitrite (as NaNO}_2\text{) mg/l} = \text{Number of Drops} \times \text{Factor (from the table)}$$

$$\text{ppm} = \text{mg/l}$$

Expected Range (mg/l)	Sample Size (ml)	Factor	Number of Drops of KS171
10 - 40	40	1.25	5
25 - 100	20	2.5	4
50 - 150	10	5	3
100 - 400	5	10	2
300 - 1000	2	25	1
500 – 2000+	1	50	1

NOTE 1

This test can be used to determine the nitrite reserve in cooling systems. Note that other reducing agents such as sulphite and ascorbic acid will increase the observed result.

Note 2

Results from this test are expressed as sodium nitrite (NaNO₂). To convert from mg/l as sodium nitrite to mg/l as nitrite (NO₂), multiply the result obtained by 0.67.

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pH Measurement (Test Strips)

Test strips are supplied for pH determination. An optional pH meter is available if greater accuracy is required.

Procedure

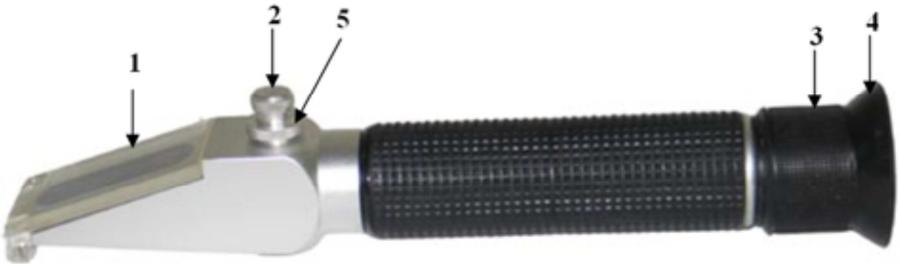
1. Remove one test strip from the pack and dip into the cooling water for a few seconds.
2. Remove and compare the colours produced on the test strip pads with the colour scale on the outside of the pack
3. Read off the pH value that corresponds to the nearest matching set of colours.
4. Record the pH value and ensure that the system pH is in the correct operating range.

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Glycol Refractometer (Not included as standard)

Code: 56M000401

A refractometer can be used to measure glycol (antifreeze levels) in closed cooling systems. The instrument measures light refraction by glycol. The greater the concentration of glycol, the greater the refraction. A calibrated scale plate inside the unit gives a direct reading of both concentration (%) and protection level ($^{\circ}\text{C}$) for both mono-propylene glycol and mono-ethylene glycol.



1-Daylight Plate 2-Calibration Screw 3-Focus Adjustment 4-Eyepiece
5-Calibration Screw Block

1. Focus the refractometer by twisting the focus adjuster (numbered 3).
2. To calibrate open the daylight plate (numbered 1), place 2 - 3 drops of distilled water onto the plate and close. Wait for approximately 30 seconds and twist the calibration screw (numbered 2) until the light/dark boundary coincides with the zero line.
3. Using one of the pipettes supplied, obtain a sample of the fluid and place 2 - 3 drops on the daylight plate (numbered 1). Close the daylight plate and read the scale of the light/dark boundary. This measurement is the percentage of glycol and protection level.
4. After measurement, clean the surface of the plate and lid with a moist cotton cloth
5. A space is provided in the test kit to include the refractometer if required.