



Internal Calibration Report of Dissolved Oxygen Meter

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|---|--|
| Equipment Ref. No. : <u>ET/EW/008/006</u> | Manufacturer : <u>YSI</u> |
| Model No. : <u>Pro 2030</u> | Serial No. : <u>12A 100554</u> |
| Date of Calibration : <u>19/12/2013</u> | Calibration Due Date : 18/03/2013 <u>18/03/2014</u> <i>As 19/12/2013</i> |

Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/008

Ref. No. of Water Bath : ---

| | | Temperature (°C) | | |
|-------------------------------|----------|------------------|------------|------|
| Reference Thermometer reading | Measured | 19.9 | Corrected | 19.6 |
| DO Meter reading | Measured | 19.4 | Difference | 0.2 |

Standardization of sodium thiosulphate (Na₂S₂O₃) solution

| Reagent No. of Na ₂ S ₂ O ₃ titrant | CPE/012/4.5/001/8 | Reagent No. of 0.025N K ₂ Cr ₂ O ₇ | CPE/012/4.4/001/23 |
|---|-------------------|---|--------------------|
| | | Trial 1 | Trial 2 |
| Initial Vol. of Na ₂ S ₂ O ₃ (ml) | | 1.00 | 12.00 |
| Final Vol. of Na ₂ S ₂ O ₃ (ml) | | 11.55 | 22.50 |
| Vol. of Na ₂ S ₂ O ₃ used (ml) | | 10.55 | 10.50 |
| Normality of Na ₂ S ₂ O ₃ solution (N) | | 0.02370 | 0.02381 |
| Average Normality (N) of Na ₂ S ₂ O ₃ solution (N) | | 0.02376 | |
| Acceptance criteria, Deviation | | Less than ± 0.001N | |

Calculation: Normality of Na₂S₂O₃, N = 0.25 / ml Na₂S₂O₃ used

Lineality Checking

Determination of dissolved oxygen content by Winkler Titration *

| Purging Time (min) | 2 | | 5 | | 10 | |
|---|---------------------|-------|---------------------|------|---------------------|-------|
| Trial | 1 | 2 | 1 | 2 | 1 | 2 |
| Initial Vol. of Na ₂ S ₂ O ₃ (ml) | 0.00 | 11.30 | 22.70 | 0.00 | 8.40 | 13.20 |
| Final Vol. of Na ₂ S ₂ O ₃ (ml) | 11.30 | 22.70 | 30.80 | 8.40 | 13.20 | 18.10 |
| Vol. (V) of Na ₂ S ₂ O ₃ used (ml) | 11.30 | 11.40 | 8.10 | 8.40 | 4.80 | 4.90 |
| Dissolved Oxygen (DO), mg/L | 7.21 | 7.27 | 5.17 | 5.36 | 3.06 | 3.13 |
| Acceptance criteria, Deviation | Less than + 0.3mg/L | | Less than + 0.3mg/L | | Less than + 0.3mg/L | |

Calculation: DO (mg/L) = V x N x 8000/298

| Purging time, min | DO meter reading, mg/L | | | Winkler Titration result *, mg/L | | | Difference (%) of DO Content |
|-------------------------------|------------------------|------|---------|----------------------------------|------|---------|------------------------------|
| | 1 | 2 | Average | 1 | 2 | Average | |
| 2 | 7.10 | 7.30 | 7.20 | 7.21 | 7.27 | 7.24 | 0.55 |
| 5 | 5.14 | 5.50 | 5.32 | 5.17 | 5.36 | 5.27 | 0.94 |
| 10 | 3.09 | 3.31 | 3.29 | 3.06 | 3.13 | 3.10 | 5.95 |
| Linear regression coefficient | | | | 0.9999 | | | |



Internal Calibration Report of Dissolved Oxygen Meter

Zero Point Checking

| | |
|------------------------|------|
| DO meter reading, mg/L | 0.00 |
|------------------------|------|

Salinity Checking

| | | | |
|-----------------------------|--------------------|-----------------------------|--------------------|
| Reagent No. of NaCl (10ppt) | CPE/012/4.7/002/13 | Reagent No. of NaCl (30ppt) | CPE/012/4.8/002/13 |
|-----------------------------|--------------------|-----------------------------|--------------------|

Determination of dissolved oxygen content by Winkler Titration **

| Salinity (ppt) | 10 | | 30 | |
|---|---------------------|-------|---------------------|-------|
| Trial | 1 | 2 | 1 | 2 |
| Initial Vol. of Na ₂ S ₂ O ₃ (ml) | 0.00 | 11.80 | 24.10 | 35.20 |
| Final Vol. of Na ₂ S ₂ O ₃ (ml) | 11.80 | 24.10 | 35.20 | 46.50 |
| Vol. (V) of Na ₂ S ₂ O ₃ used (ml) | 11.80 | 12.30 | 11.10 | 11.30 |
| Dissolved Oxygen (DO), mg/L | 7.53 | 7.85 | 7.08 | 7.21 |
| Acceptance criteria, Deviation | Less than + 0.3mg/L | | Less than + 0.3mg/L | |

Calculation: $DO \text{ (mg/L)} = V \times N \times 8000/298$

| Salinity (ppt) | DO meter reading, mg/L | | | Winkler Titration result**, mg/L | | | Difference (%) of DO Content |
|----------------|------------------------|------|---------|----------------------------------|------|---------|------------------------------|
| | 1 | 2 | Average | 1 | 2 | Average | |
| 10 | 7.55 | 7.89 | 7.72 | 7.53 | 7.85 | 7.69 | 0.39 |
| 30 | 7.04 | 7.16 | 7.1 | 7.08 | 7.21 | 7.15 | 0.70 |

Acceptance Criteria

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / unacceptable # for use.

Delete as appropriate

Calibrated by

:

Approved by :



Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/006 Manufacturer : YSI

Model No. : Pro 2030 Serial No. : 12A 100554

Date of Calibration : 19/12/2013 Due Date : 18/03/2014

Ref. No. of Salinity Standard used (30ppt)

S/001/5

| Salinity Standard (ppt) | Measured Salinity (ppt) | Difference % |
|-------------------------|-------------------------|--------------|
| 30.0 | 30.8 | 2.63 |

Acceptance Criteria

Difference : <10 %

The salinity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 



Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/010 Manufacturer : HACH

Model No. : 2100Q Serial No. : 11110 C 014260


Date of Calibration : 07/01/2014 Due Date : 06/04/2014

| Gelex Vial Std | Theoretical Value (NTU) | Measured Value (NTU) | Difference % |
|----------------|-------------------------|----------------------|--------------|
| 0-10 NTU | 5 | 5.11 | 2.18 |
| 10-100 NTU | 50 | 51.1 | 2.18 |
| 100-1000 NTU | 550 | 568 | 3.22 |

Acceptance Criteria

Difference : -5 % to 5%

The turbidity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 