# MODEL 3205
# ION METER
# OPERATING MANUAL

539 506

**MODEL 3205 WATERPROOF**
**ION METER**
**OPERATING MANUAL**

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3205/REV A/11-95

# MODEL 3205 ION METER
# OPERATING MANUAL

## INTRODUCTION

The Model 3205 is ruggedly designed and constructed to resist the harshest of field, industrial and laboratory environments. The instrument is supplied with a Temperature sensor.

## SPECIFICATION

| | |
|---|---|
| pH | (1 or 2 point calibration) |
| Range: | -2 to 16.00pH |
| Resolution: | 0.01pH |
| Accuracy: | ±0.02pH |
| mV | (Absolute or Relative) |
| Range: | -1999 to +1999mV |
| Resolution: | 1mV |
| Accuracy: | ±1mV |
| Temperature Measuring | |
| Ranges: | -10 to +105°C<br>14 to 220°F |
| Resolution: | 0.1°C 1°F |
| Accuracy: | ±0.5°C ±1°F |
| ATC Range: | 0 to 100°C |
| Activity: | 1x10-9 to 9.99 x 109 in integer or exponential format |
| Auto Buffer Recognition: | 4.00, 7.00 and 10.05 (manual override) |
| Calibration: | User selectable 1 or 2 point<br>Multipoint 1 to 5 point |

**SPECIFICATION (continued)**

| | |
|---|---|
| Direct Ion Measurement: | |
| Range: | $1.00x10^{-9}$ to $9.99x10^{+9}$ |
| Slope Efficiency of Nominal: | 0.6 to 1.4 (monovalent)<br>0.3 to 0.7 (divalent) |
| Calibration: | 1, 2 or 3 point |
| Display format: | Integer or exponential |
| Ions: | $NO_3$, Ca, $NH_4$, $NO_2$, Cl, F |
| Units: | ppm, Act, M, %, $mgL^{-1}$ and none |
| Clock: | 24 hour, hours/mn/sec or day of month, month and year, leap year corrected |
| Power: | 3 AA cells |
| Size: | 200(l)x80(w)x60(d) |
| Weight: | 370g |

## INSTALLATION

Unpack the instrument and ensure the following items are present:

1. Model 3205 pH Meter (539 501)
2. Temperature Probe (027 228)
3. 3 x AA alkaline batteries (021 007)

**Optional accessories which may have been ordered:**

1. Carrying Case (033 162)
2. Steel Protected spear pH probe (924 034)

**INSTALLATION (continued)**

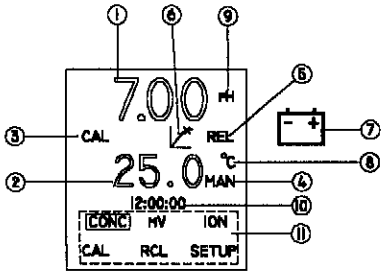
3. Reference electrode with
   in-built ATC (027 229)
4. Adaptor lead (538 014)
5. Interface Cradle (542 001)
6. Interface Cable Kit (542 009)
7. 40 Column Printer (543 001)
8. Paper Roll for Printer (060 287)
9. Printer Ribbon (060 288)
10. Electrode Kit(s)
11. Ion Selective Electrode(s)
12. Calibrating Standard(s)
13. Ionic Strength Adjustment Buffer(s)

Remove the battery compartment cover and fit the batteries, taking care to observe the correct polarity, as indicated on the moulding.

## LCD CONTRAST

The LCD contrast can be set at initial power up of the instrument. The LCD contrast potentiometer is accessible with the battery compartment cover removed. This adjustment should only need to be made on receipt of the instrument. After initial adjustment the instrument will automatically adjust the contrast depending on the temperature of the glass.

**DISPLAYS**




1. Primary display - provides direct readout of pH, Activity, mV or Ion samples.
   If the primary reading is overrange this display will indicate "1" with all other digits blanked and the error message **OVERRANGE.**
   If the primary reading is underrange this display will indicate "-1" with all other digits blanked and the error message **UNDERRANGE.**

   Primary Ranges:
   pH -2.00 to 16.00
   mV -1999 to +1999
   Activity $1x10^{-9}$ to $9.99x10^{9}$
   Ion $1x10^{-9}$ to $9.99x10^{9}$

**DISPLAYS (continued)**

2. Auxiliary display - provides direct readout of temperature in °C or °F. If the auxiliary reading is overrange this display will indicate "1" with all other digits blanked.
   If the auxiliary reading is underrange this display will indicate "-1" with all other digits blanked.

   Auxiliary Ranges:
   Temp -10 to 105°C
   14 to 220°F

3. CAL 1, 2, 3, 4 or 5 - indicates a 1-5 point calibration.

4. MAN - used to set manual temperature.

5. REL - Relative millivolt symbol. This appears only in the mV mode.

6. Endpoint Detection symbol - this is displayed once a stable reading is detected and is maintained until the input changes.

7. Low Battery Indicator - this will be displayed when a maximum of 5 hours battery life remains.

8. Selected temperature measurement unit - °C or °F.

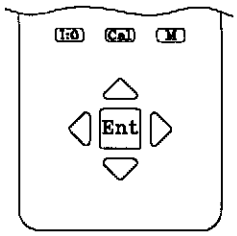
**DISPLAYS (continued)**

9. Measurement unit which is being used, pH, mV, activity or ion.

10. Real Time Clock giving continuous display of hours, minutes and seconds or day, month and year. All logged results are automatically time stamped.

11. Menu - used for selection of modes of operation. The selected mode is reverse highlighted. To select, highlight the appropriate mode of operation using the arrow keys, then press ENT.
**NOTE: The menu wraps around.**
To exit to another mode, highlight the required mode using the arrow keys and press ENT. To escape from a measurement sequence/mode move to the EXIT option and press ENT. This will return the instrument to the start of the previously selected menu.

## CONTROLS




I:O Switches the instrument on and off.

CAL This key is mode dependent. It is used to select and perform calibration in the pH, pH CAL, Activity, Activity CAL, Ion and Ion CAL modes. In the mV mode pressing the CAL key will enable the user to toggle between Absolute and Relative millivolts. The CAL key is non-functional in any other mode.

M The Memory Store key is used to store the displayed readings in any measurement mode.

▲▼ These keys are used to change a parameter.
1. Used when storing a reading to change the stored location index.
2. In recall (RCL) mode these keys are used to change the displayed stored location.

**CONTROLS (continued)**

3. The keys are used to move vertically between menu options.
4. In Set-Up mode these keys are used to modify the set up parameters.
5. Used to change the Manual Temperature Compensation value when using alternative electrodes and no temperature probe is fitted.

◄ ► 1. These keys are used to move horizontally between menu options.
2. In Set-Up these keys are used to select the part of the parameter required for modification.

ENT The ENT (enter) key is used to select the displayed menu option. It also places stored values in the selected location(s).

## OPERATION

Switch the instrument on using the I:O key. The display will show INITIALISING... for approximately 2 seconds. The screen will then show the mV, pH, Conc or Ion mode, dependent on the mode last used prior to switch off. This will be indicated by the displayed measurement unit. The CAL key will be reverse highlighted. To change the mode, move to the required mode by using the arrow keys and then press the ENT key.

## MENU OPTIONS

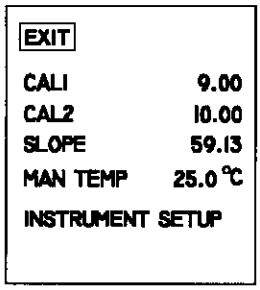
**CONC mV ION**

**CAL RCL SETUP**

CONC concentration mode
mV millivolt mode
ION ion mode
CAL pH calibration mode (CAL key can be used as a short cut).
RCL recall mode for stored readings
SETUP Used to set up mode specific parameters, instrument and clock set up.

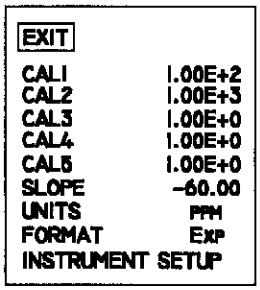
## SET UP OPTIONS

### 1. pH SET UP MENU



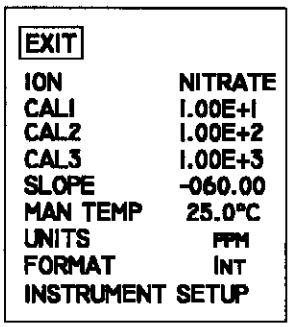

EXIT - menu escape key
CAL 1 - calibration buffer value
CAL 2 - calibration buffer value
SLOPE - electrode slope value
MAN TEMP - used to set manual temperature value in pH and ION modes when no temperature probe is connected or the ATC is non-functional.
INSTRUMENT SET UP - used to select the next set up menu for instrument parameters.

## 2. CONCENTRATION SET UP MENU



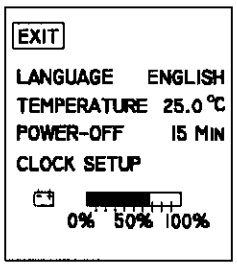

EXIT - menu escape key
CAL 1 - calibration buffer value
CAL 2 - calibration buffer value
CAL 3 - calibration buffer value
CAL 4 - calibration buffer value
CAL 5 - calibration buffer value
SLOPE - electrode slope value
UNITS - selected unit of measurement (ppm, %, none, Activity, mg/l, M)
FORMAT - exponential or integer
INSTRUMENT SET UP - used to select the next menu for instrument parameters

## 3. ION SET UP MENU



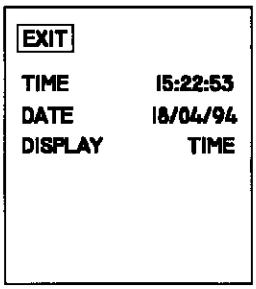

EXIT - menu escape key
ION - selected ion
CAL 1 - calibration buffer value
CAL 2 - calibration buffer value
CAL 3 - calibration buffer value
SLOPE - electrode slope value. This is the current slope between CAL 1 and CAL2. If changed, it is used for a 1 point calibration.
MAN TEMP - used to set manual temperature value in pH and ION modes when no temperature probe is connected or the ATC is non-functional
UNITS - selected unit of measurement (ppm, %, none, activity, mg/l, M)
FORMAT - exponential or integer
INSTRUMENT SET UP - used to select the next menu for instrument parameters

## 4. INSTRUMENT SET UP MENU




EXIT - menu escape key
LANGUAGE - used to set preferred language option (English, French, German, Italian, Spanish and Swedish)
TEMPERATURE - used for selection of measurement in °F or °C
POWER-OFF - used to select auto shut off time interval (15, 30, 45, 60 minutes, or disabled)
CLOCK SET UP - used to select clock set up menu
Estimated battery life indicator

## 5.CLOCK SET UP MENU




EXIT - menu escape key
TIME - real time clock set up
DATE - date set up
DISPLAY- used to select display
of time, date or none

## pH MODE

### pH CALIBRATION - AUTOMATIC

Auto buffer recognition operates over the range of 0 to 100°C, and will recognise 4.00, 7.00 and 10.05pH.
**NOTE: Rinse electrode(s) in deionised water between measurements. The ▲▼ keys do not work in pH CAL mode.**

Calibration is performed by either pressing the CAL key or by moving the cursor to the CAL menu option by using the arrow keys and then pressing the ENT key. The readout will then display CAL 1.
The electrode(s) should be placed into the required buffer and the reading allowed to stabilise (the endpoint symbol will be displayed) prior to pressing the ENT or CAL key. The display will then update to the standard buffer value, corrected for temperature (actual temperature will be displayed). The display will then indicate CAL 2.

If a one point calibration only is required, select the EXIT option by using the ◄► keys and then press ENT. The instrument will return to the start of the pH mode.

If a two point calibration is required, the electrode(s) should be rinsed and then placed into the second buffer solution. Allow the reading to stabilise (the endpoint symbol will be displayed) prior to pressing the ENT or

## pH CALIBRATION AUTOMATIC (cont)

CAL key. The display will update to this calibration value and then return to the pH mode.

## pH CALIBRATION - MANUAL

**NOTE: Rinse the electrode(s) in deionised water between measurements.**

Select the pH menu. If the manual buffer values require adjustment before calibration enter into the SET UP mode by selecting the SET UP menu option and pressing the ENT key.

Select the parameter to be changed using the ▲▼ keys, once highlighted, adjustment of the parameter proceeds by pressing ENT or the ► key. The first part of the parameter is highlighted and can be adjusted to the required value using the ▲▼ keys. If further precision adjustment is required move the highlighted cursor to the next adjustable position using the ► key and adjust as required. Continue moving across the parameter until full adjustment has been made. To confirm set value press ENT or press ◄ key until the selected option is re-highlighted.

When all parameters have been set move to the EXIT option using the ▲▼ keys and press the ENT key.

Calibration is performed by either pressing the CAL key or by moving the cursor to the CAL menu option by using the arrow keys and then pressing the ENT key. The readout will then display CAL 1.

The electrode(s) should be placed into the required buffer and the reading allowed to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to the set buffer value corrected for temperature (actual temperature will be displayed). The display will then indicate CAL 2.

If a one point calibration only is required, select the EXIT option using the arrow keys and then press ENT. The instrument will return to the pH mode.

If a two point calibration is required the electrode(s) should be rinsed and then placed into the second buffer solution. Allow the reading to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to that value and then return to the pH mode.

## ERROR MESSAGES

If a problem is detected during calibration the following highlighted error messages will be displayed:

### CAL OUT OF RANGE

This indicates that the instrument has not recognised the buffer. The displayed reading must be within 0.5pH of the calibration buffer value.
The error message will remain on the instrument display until EXIT is selected or the instrument is recalibrated. The calibration data is reset back to the Nernst response.

### SLOPE OUT OF RANGE

This message indicates that the slope value is out of range. The error message will remain on the instrument display until EXIT is selected or the instrument is recalibrated. The calibration data is reset back to the Nernst response.

## MANUAL TEMPERATURE COMPENSATION

**NOTE: This is only operational in pH mode.**

When using an alternative electrode without ATC, or if the ATC is non-functional, the displayed temperature reading can be adjusted to the required value in the Set Up menu. The instrument will default to this mode if a temperature sensing element is not detected by the electronics.

## CONCENTRATION MODE

Ion analysis is a measurement of the concentration of the ion in question in a given solution. The concentration units can be expressed as ppm, %, none, Activity, mg/l or M.

Activity is defined as the effective free ion concentration in the solution. This is related to the total concentration of ion by the activity coefficient. The difference between the activity of the ion and the concentration of the ion is the amount of the ion complexed to other species in solution, effectively removing them from availability for chemical reaction.

Ion activity can be displayed in either integer or exponential formats (selectable from the SET UP menu).

However, it should be noted, that if integer format is selected and the reading goes beyond the limits of >9999 or <0.01, the display will automatically select exponential format, reverting to integer format when the reading re-enters these limits.

## ACTIVITY
## CALIBRATION - SEQUENTIAL

**NOTE: Rinse the electrode(s) in deionised water between measurements.**

Select the CONC menu. If the calibration solution values require adjustment before calibration enter into the SET UP mode by selecting the SET UP menu option and pressing the ENT key.

Select the parameter to be changed using the ▲▼ keys, once highlighted, adjustment of the parameter proceeds by pressing ENT or the ► key. The first part of the parameter is highlighted and can be adjusted to the required value using the ▲▼ keys. If further precision adjustment is required move the highlighted cursor to the next adjustable position using the ► key and adjust as required. Continue moving across the parameter until full adjustment has been made. To confirm set value press ENT or press ◄ key until the selected option is re-highlighted.

When all parameters have been set move to the EXIT option using the ▲▼ keys and press the ENT key.

Calibration is performed by either pressing the CAL key or by moving the cursor to the CAL menu option by using the arrow keys and then pressing the ENT key. The readout will then display CAL 1.

The electrode(s) should be placed into the required calibration solution and the reading allowed to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to the set CAL 1 solution value. The display will then indicate CAL 2.

If a one point calibration only is required, select the EXIT option using the arrow keys and then press the ENT key. The instrument will return to the CONC mode.

If a two point calibration is required the electrode(s) should be rinsed and then placed into the second calibration solution. Allow the reading to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to the set

CAL 2 solution value. The display will then indicate CAL 3.

Further calibrations (up to a maximum of 5 point) are carried out in an identical manner. After a 5 point calibration has been completed the display will then update to that value and then return to the CONC mode.

## ACTIVITY CALIBRATION - NON SEQUENTIAL

When performing an activity calibration, it is not always necessary to perform the operation sequentially starting at CAL1 if the instrument has already been calibrated and for example, the instrument only requires re-calibrating at the CAL3 point.

Non-sequential calibration is performed by either pressing the CAL key or by moving the cursor to the CAL menu option by using the arrow keys and then pressing the ENT key. The readout will then display CAL 1.

Select the calibration point required by pressing the ▲ key, the CAL display will increase to the next calibration point CAL2, continue pressing the ▲ key until the required calibration point is reached.

Allow the reading to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to the set CAL solution value. The display will then indicate the next CAL point.

**NOTE: When performing a non-sequential calibration, the maximum calibration point which can be manually selected is determined by the number of points the original calibration was performed to.**

Example: If a 4 point calibration was performed initially, a calibration point no higher than CAL 4 can be selected using the ▲ key.

## ERROR MESSAGES

If a problem is detected during calibration the following highlighted error messages will be displayed:

## CAL OUT OF RANGE

This indicates a change in slope direction for the calibration solutions. This can be caused by the user attempting to calibrate on a non-sequential solution value which would have the effect of changing the direction of the

calibration slope.
The error message will remain on the instrument display until EXIT is selected or the instrument is recalibrated.

## SLOPE OUT OF RANGE

This message indicates that the slope value is outside the ranges of:

+10 to +90 or -10 to -90

The error message will remain on the instrument display until EXIT is selected or the instrument is recalibrated. The slope is updated with the manual slope value entered in the SET UP mode.

## ION MEASUREMENT

The Model 3205 software will give the operator very specific guidance when analysing the programmed ions. Utilising default values for calibration points, electrode slope range and temperature, results will be directly displayed in user determined concentration units.

The Model 3205 has been pre-programmed for use with the following electrodes, also indicated is the nominal slope potential of these electrodes when operating at 25°C.

**ION MEASUREMENT (cont)**

| | |
|---|---|
| Ammonium | +ve 59.16mV |
| Calcium | +ve 29.58mV |
| Chloride | -ve 59.16mV |
| Fluoride | -ve 59.16mV |
| Nitrate | -ve 59.16mV |
| Nitrite | -ve 59.16mV |

Selected parameters are stored in non-volatile memory. The user selected variables need only be entered when moving from one ion analysis to another, or when first carrying out a determination.

Calibration values will normally hold good for several hours, which allows calibration to take place in the laboratory prior to field testing.

The Ion Selective Electrodes are automatically compensated by the 3205, but minimum errors are achieved by having calibration solutions and samples at similar temperatures.

The units of measurement incorporated into the 3205 can be changed at any time with automatic conversion between chosen options.

## ION CALIBRATION

**NOTE: Rinse the electrode(s) in deionised water between measurements.**

Select the ION menu. If the manual buffer values require adjustment before calibration enter into the SET UP mode by selecting the SET UP menu option and pressing the ENT key.

Select the parameter to be changed using the ▲▼ keys, once highlighted, adjustment of the parameter proceeds by pressing ENT or the ► key. The first part of the parameter is highlighted and can be adjusted to the required value using the ▲▼ keys. If further precision adjustment is required move the highlighted cursor to the next adjustable position using the ► key and adjust as required. Continue moving across the parameter until full adjustment has been made. To confirm set value press ENT or press ◄ key until the selected option is re-highlighted.
NOTE: Calibration values must be entered in ascending or descending order. If this rule is not applied the instrument will default high or low ($1.00x10^{-9}$ or $9.99x10^{9}$) to the measurement values. The reading will automatically update to the default value.
The 3205 will default to the concentrations of calibrant supplied with the electrode kits. Manual adjustment to the enter the correct value is possible at this point.

**ION CALIBRATION (cont)**

When all parameters have been set move to the EXIT option using the ▲▼ keys and press the ENT key.

Calibration is performed by either pressing the CAL key or by moving the cursor to the CAL menu option by using the arrow keys and then pressing the ENT key. The readout will then display CAL 1.

The electrode(s) should be placed into the required buffer and the reading allowed to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value. The display will then update to the set buffer value corrected for temperature (actual temperature will be displayed). The display will then indicate CAL 2.

If a one point calibration only is required, select the EXIT option using the arrow keys and then press ENT. The instrument will return to the ION mode.

If a two point calibration is required the electrode(s) should be rinsed and then placed into the second buffer solution. Allow the reading to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value.

## ION CALIBRATION (cont)

If a three point calibration is required the electrode(s) should be rinsed and then placed into the third buffer solution. Allow the reading to stabilise (the endpoint symbol will be displayed). Press the ENT or CAL key to calibrate the instrument to the set value.

The display will then update to that value and then return to the ION mode.

## ERROR MESSAGES

If a problem is detected during calibration the following highlighted error message will be displayed:

## SLOPE OUT OF RANGE

This message indicates that the slope efficiency value is out of range. The error message will remain on the instrument display until EXIT is selected or the instrument is recalibrated. The calibration data is reset back to the Nernst response.

## mV MODE

Select the mV mode by using the arrow keys and then pressing ENT. The instrument can toggle between Absolute and Relative mV by pressing the CAL key. Relative mV mode is indicated by REL appearing on the display.

## STORING RESULTS

The M key (Memory Store) is used to store the displayed readings in any measurement mode. When the M key is pressed the display will show the main and auxiliary readings, the previous menu options will be replaced by a new set containing the menu option ABORT NN (NN is the first available free location for the displayed reading).

To store the displayed reading at the current index number the ENT key should be pressed or if no key is pressed within 5 seconds the reading will be automatically stored in this location. The instrument will then return to the previously selected mode. If the reading is not to be stored, moving to the ABORT option using the arrow keys and pressing ENT will return the instrument to the previously selected mode without storing the reading.

To store a reading in a specific location use the ▲▼ keys to select the required location and then press ENT or if no other key is pressed within 5 seconds the reading will be automatically stored in this location. The instrument will then return to the previously selected mode.

**NOTE: Automatic storage after 5 seconds is only instigated after the last key press. If a key is pressed and held down the timer is disabled until the key is released. At this stage the 5 second timer is re-initialised.**

The non-volatile storage area has the facility to store 100 readings. If, however, an attempt is made to store a reading with all locations full, the highlighted message MEMORY FULL will be displayed for approx. 2 seconds, returning the highlighting to the ABORT option. If it is necessary to store the reading the location will have to be selected within the index option using the arrow keys.

**NOTE: Storing a reading when the memory is full will overwrite any previous data stored in selected location.**

## RECALLING STORED READINGS

To recall a stored reading select the RCL menu option by using the arrow keys and then pressing ENT. The display will update to the stored reading and the stored index number will be shown at the bottom of the display.

If no stored reading is present the display

will give the message NO RECORD STORED.

To select a specific stored reading, select the INDEX: option using the arrow keys and press ENT. To select the required location use the ▲▼ keys. The display will update to the selected reading. To exit the RCL mode select the EXIT option and press ENT. The instrument will return to the previous display.

## CLEARING STORED READINGS

To clear an individual stored reading select the RCL mode using the arrow keys and press ENT. Select INDEX: by using the arrow keys and press ENT. Select the specific location to be deleted using the▲▼ keys. Move to the DELETE menu option by using the arrow keys and press ENT. The display will clear and then update to show the message NO RECORD STORED, returning the highlighting to the location number.

Selecting the EXIT option and pressing ENT will return the instrument to the previous display.

To clear all stored readings select the CLR/ALL menu option using the arrow keys and then pressing ENT. The display will momentarily display the message DELETING... The display will then update to show the message ALL RECORDS

DELETED.

Selecting the EXIT option and pressing ENT will return the instrument to the previous display.

## DOWNLOADING STORED READINGS

**NOTE: To perform the downloading function ensure the Interface Cradle (542 001) and relevant interface cables are correctly installed to the receiving terminal. Please refer to separate installation/operating instructions supplied with the Interface Cradle.**

To download stored readings select the RCL mode using the arrow keys and press ENT. Select TX DATA by using the arrow keys and press ENT. This will start the downloading process, automatically returning the instrument to the previous display.

## REAL TIME CLOCK SET UP

Real time clock set up is performed by entering into the INSTRUMENT SET UP mode, selecting CLOCK SET UP using the ▲▼ keys and pressing the ENT key.

Select the real time clock parameter to be changed using the ▲▼ keys, once highlighted, adjustment of the parameter proceeds by pressing ENT or the ▸ key.

The first part of the parameter is highlighted and can be adjusted to the required value using the ▲▼ keys. If further adjustment is required move the highlighted cursor to the next adjustable position using the ►key and adjust as required. Continue moving across the parameter until full adjustment has been made. To confirm new time or date press ENT or press ◄ key until the selected parameter is re-highlighted.

**AUTO SHUT OFF**

This can be achieved by setting the required shut off time (15, 30, 45, 60 or disabled) in the Instrument Set Up menu.

range of 0 to 80°C. Ageing of electrodes used above their specified temperature is rapid and irreversible.

4. **DO NOT** touch the sensitive glass pH membrane or reference junction during use. Excess droplets of solution may be removed by gently blotting with filter paper or tissue. **DO NOT** rub the electrode as this may induce an electrostatic charge.

5. During use ensure the electrode is rinsed between each measurement to eliminate the contamination of solutions.

## MAINTENANCE

## CLEANING/RE-CONDITIONING OF GLASS ELECTRODES

For general purpose use, combination electrodes can be cleaned with a mild detergent solution or a commercial glass cleaning solution (provided these are not strongly acidic). The electrode surface should be wiped with a clean cloth soaked in the cleaning agent, and/or allow the membrane to stand in the solution until clean. Rinse and repeat as necessary.

## TABLE FOR CLEANING OF GLASS ELECTRODES

**NOTE: The epoxy bodied electrode supplied with the instrument should not be cleaned with aggressive solvents.**

| DEPOSIT | CLEANING AGENTS |
|---|---|
| General deposits | Mild detergent solution |
| Inorganic coatings | Commercial glass cleaning solution (not strongly acidic) |
| Metal compounds | Acid solution, not stronger than 1M |
| Oil/Grease | Complexing agent (EDTA) or suitable solvent |
| Resins/Lignins | Acetone, alcohol or detergent (not strongly alkaline) |
| Proteins (blood,etc) | Enzyme solutions e.g. Pepsin in 0.1M HCl |
| Stubborn deposits | Weak hydrogen peroxide solution, Sodium Hypochlorite solution or domestic bleach. |

Electrodes which have been allowed to dry out, (often indicated by a hard, dry deposit of KCl crystals on the electrode body), should be rehabilitated by soaking overnight in warm distilled water.

For details on the care and maintenance of ion selective electrodes please refer to the specific instruction sheet supplied with the electrode.

## BATTERY REPLACEMENT

The battery symbol will be displayed to the right hand side of the display to indicate a maximum of 5 hours battery life remains.
An approximation (±2%) of remaining battery life can be achieved by viewing the battery life indicator displayed within INSTRUMENT SET UP mode.

NOTE: **Stored results are retained in non-volatile memory and will not be lost during battery replacement. Re-adjustment of the real time clock will be required.**

To fit new batteries; remove the battery compartment cover, remove and carefully discard the used batteries. Fit the new batteries, type R6, AA or AM3, ensuring the correct polarities are observed, as indicated on the moulding. Refit the battery compartment cover, ensuring that the fixings are secured into place, but are not overtightened.

## GOOD PRACTICE GUIDELINES

The types of pH electrodes are many and various. For the majority of tests carried out on aqueous solutions; with a reasonable ionic strength, at ambient temperatures and with limited use in strongly acidic solutions, the epoxy bodied combination electrode supplied is ideal.
For other applications a more suitable pH/reference electrode pair may be required. Details or advice supplied on request.

The following general guidelines indicate the care and maintenance required:

1. **After use**
   Rinse thoroughly with distilled water.

   **Short Term Storage**
   Immerse in pH 4 buffer

   **Long Term Storage**
   Fit wetting cap filled with pH 7 buffer (Combination)
   Fit wetting cap filled with pH 4 buffer (Reference/pH)

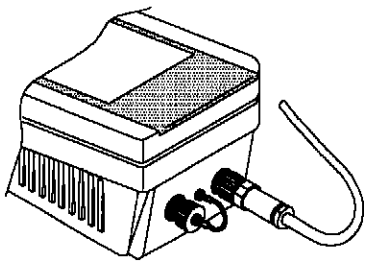
2. Electrodes should be stored:
   a) away from direct sunlight
   b) in a vertical position
   c) within their specified temperature range

3. Always ensure the electrode is used within its specified temperature

## ELECTRODE REPLACEMENT

To replace the pH electrode switch off the model 3205 and disconnect the faulty electrode by carefully unscrewing the locking ring counter-clockwise and withdrawing the connector from the receptacle. Fit the new electrode by reversing the above method, ensuring that the polarising keyway is correctly aligned and the locking ring is tightened to prevent the ingress of moisture. A separate reference or temperature probe may be connected to the unused socket after first removing the dust cap.

NOTE: **To ensure a waterproof seal is maintained an electrode or the dust cap must be fitted at all times.**



## OPTIONAL ACCESSORIES

The following list of items are available for use with the Model 3205:

| | |
|---|---|
| **033 162** | Carrying Case |
| **924 034** | Steel protected Spear pH Probe |
| **027 228** | Temperature probe |
| **027 229** | Reference electrode with in-built ATC |
| **538 014** | Adapter lead |
| **542 001** | Interface Cradle |
| **542 009** | Interface Cable Kit |
| **543 001** | 40 Column Printer |
| **060 287** | Printer Paper Roll |
| **060 288** | Printer Ribbon |

For details on the following items please contact the manufacturer or your local distributor:

Electrode Kits
Ion Selective Electrodes
Calibrating Standards
Ionic Strength Adjustment Buffers

## SPARES

| | |
|---|---|
| **027 227** | pH/Temperature Electrode |

**HEALTH & SAFETY**

**PRODUCT:** Buffer Capsules

**PHYSICAL DATA**
Description: White Powder
Solubility in water: soluble

**HEALTH HAZARD** - Harmful if ingested in quantity. May be irritating or cause physical damage in contact with eyes.
Toxicity data: no data
Carcinogenicity: No evidence of carcinogenic properties
Mutagenicity/Teratogenicity: No evidence of mutagenic or teratogenic effects
Exposure limits: Not assigned (Long term 8 hour TWA)

**FIRST AID**

| | |
|---|---|
| Eyes | Irrigate thoroughly with water. If discomfort persists **OBTAIN MEDICAL ATTENTION.** |
| Lungs | Remove from exposure. |
| Skin | Wash off thoroughly with soap and water. |
| Mouth | Wash out mouth thoroughly with water. In severe cases **OBTAIN MEDICAL ATTENTION.** |

**STORAGE AND HANDLING**
Special requirements - none

## EC Declaration of Conformity

JENWAY Model 3205 Ion Meter complies with the following European Standards:

EN 50081-1:1992 Electromagnetic compatibility -Generic emission standard

EN 50082-1:1992 Electromagnetic compatibility - Generic emission standard

EN 61010-1:1993 Safety requirements for electrical equipment for measurement, control and laboratory use

Following the provision of:

EMC Directive - 89/336/EEC and
Low Voltage Directive - 73/23/EEC

Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.

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