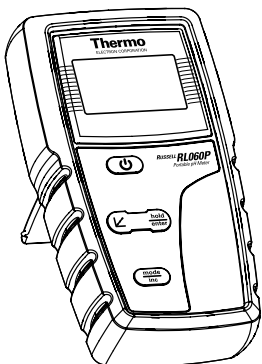


Russell RL060P

User's Guide



Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION

ROSS and the COIL trade dress are trademarks of Thermo Electron Corporation.

AQUAfast, Cahn, EZ Flash, Ionalyzer, ionplus, KNipHE, No Cal, ORION, perpHect, PerpHecT, PerpHecTion, pHISA, pHuture, Pure Water, Sage, Sensing the Future, SensorLink, ROSS Ultra, Sure-Flow, TEA Analyzer, Titrator PLUS, TURBO2 and Wine Master are registered trademarks of Thermo.

1-888-pHAX-ION, A+, All in One, Aplus, AQUAsnap, AssuredAccuracy, AUTO-BAR, AUTO-CAL, AUTO DISPENSER, Auto-ID, AUTO-LOG, AUTO-READ, AUTO-STIR, Auto-Test, BOD AutoE Z, Cable-Free, CERTI-CAL, CISA, DataCOLLECT, DataPLUS, digital LogR, DirectCal, DuraProbe, Environmental Product Authority, Extra Easy/Extra Value, FAST QC, Flash Titration, Flash Titrator, GAP, GLPcal, GLPcheck, GLPdoc, ISEasy, KAP, LabConnect, LogR, Low Maintenance Triode, Minimum Stir Requirement, MSR, NISS, One-Touch, One-Touch Calibration, One-Touch Measurement, Optimum Results, Orion Constellation Software, Pentrode, pHuture MMS, pHuture Pentrode, pHuture Quatrode, pHuture Triode, Quatrode, QuiKcheK, rf link, ROSS, ROSS Resolution, SAOB, SMART AVERAGING, Smart CheK, SMART STABILITY, Stacked, Stat Face, The Enhanced Lab, ThermoSense, Triode, TRIUMpH, Unbreakable pH, Universal Access are trademarks of Thermo.

Guaranteed Success and The Technical Edge are service marks of Thermo.

PerpHecT meters are protected by U.S. patent 6,168,707.

PerpHecT ROSS are protected by U.S. patent 6,168,707.

ORION Series A meters and 900A printer are protected by U.S. patents 5,198,093, D334,208 and D346,753.

ionplus electrodes and Optimum Results solutions are protected by US Patent 5,830,338.

ROSS Ultra electrodes are protected by US patents pending 6,793,787.

Orion ORP Standard is protected by US Patent 6,350,367.

Orion NoCal electrodes have patent pending.

© Copyright 2005, Thermo Electron Corporation. All rights reserved. Question everything, and Analyze.Detect.Measure.Control are trademarks of Thermo Electron Corporation.

The specifications, descriptions, drawings, ordering information and part numbers within this document are subject to change without notice.

This publication supersedes all previous publications on this subject.

Table of Contents

Chapter I

Introduction 1

Chapter II

Getting Started 2

Chapter III

Calibration 6

Chapter IV

Measurement 14

Chapter V

Electrode Care and Maintenance 15

Chapter VI

Troubleshooting 16

Chapter VII

Specification 17

Chapter VIII

Accessories 18

Chapter IX

Terms and Conditions 20

Chapter X

Declaration of Conformity 24

Chapter XI

Assistance 25

Chapter XI

WEEE Compliance 26

Chapter I

Introduction

Thank you for purchasing the pH RL060P meter. This microprocessor-based handheld meter is economical and easy to use. It has a large custom LCD (Liquid Crystal Display) for clear and easy reading.

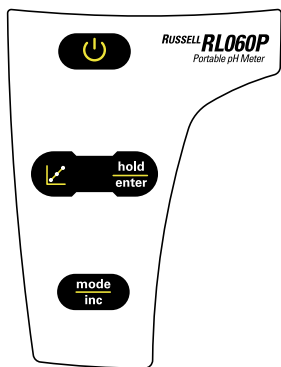
The pH RL060P measures pH and temperature (°C).

Included with your meter are 4 alkaline “AAA” batteries, temperature sensor, instruction manual and a warranty card. Some models also include a rubber armor. To order other accessories and buffer calibration or standard solutions, please refer to **Chapter VIII, Accessories** for more information.

Chapter II


Getting Started


Description of Keypad Functions





pH RL060P has four keys on its splash-proof keypad with tactile feedback. The common keys include




: Powers meter on and off. Meter starts up in the mode that you last switched off from.

: Selects measurement mode for mV, pH and Temperature.

: Allows calibration for pH, mV or Temperature, and will also abort the calibration without confirming any set value.

 (hold): Freezes the measured reading for easy viewing.

 (enter): Confirms the calibration value.

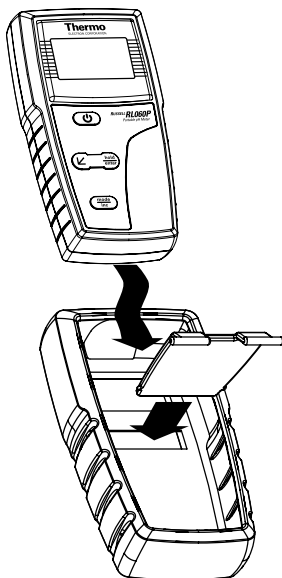
Description of LCD Annunciators



The meter has a large custom LCD that consists of 31/2-digit segments and operation annunciators for pH, mV or °C (Temperature). Other annunciators include “HO” (when the HOLD function is activated) and “LO” (low battery condition).

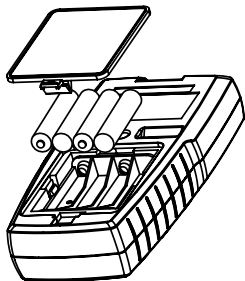
Inserting & Removing the Rubber Armor

Some models also include a rubber armor



1. To remove the meter from the rubber armor, push the bottom edges of meter out until it is completely separated from the armor. Ensure that the cables on the pH electrode or the temperature probe are not connected.
2. To insert the meter into the rubber armor, slide in from the top of meter before pushing the bottom edges down and set it into position. Lift up the stand at the back of the meter for bench top applications if necessary.

Inserting New Batteries



The battery compartment is found at the back of instrument. To open the battery compartment, push in the direction of the arrow and lift up the cover. Note the polarity of the battery before inserting it into position. After replacement, place the cover back and press down until it locks tight.

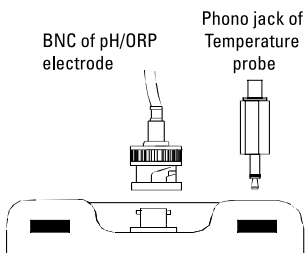
Battery Replacement



A "LO" annunciator in the LCD alerts you when battery power is running low. The replacement batteries are 4 alkaline "AAA".

Caution: *Power off the meter when changing batteries.* ▲

Connecting the Electrode and Temperature Sensor



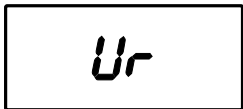
To connect the electrode into meter, align the connector slots with the posts of meter's socket and rotate the connector clockwise until it locks. Do not force when connecting. To remove, simply rotate the connector in anti-clockwise direction until it unlocks, and slide the connector off the socket.



Insert the mini phono jack of the temperature sensor into the socket on the meter. Unplug the phono jack when it is not in use or if you measure pH without any temperature compensation.

Condition the pH Electrode

Condition the pH electrode before use or if it has not been in use for a long time. This can be done by soaking it into a container filled with pH 4 buffer solution for at least 1 hour. Rinse with water before proceeding to calibrate the electrode with the meter.

Switching the Meter On



1. Press  to power up your meter. All LCD segments display momentarily as the meter performs a self-diagnostic test
2. Press  to choose your desired mode of measurement. The corresponding annunciator displays in the LCD.

In temperature mode, the measured reading can be 25.0 °C (factory default). The last calibrated temperature value will appear if there is no temperature probe connected, or current measured value will appear if a temperature probe is connected.

3. The LCD displays "**Or**" if the meter reading exceeds the maximum or "**Ur**" if under minimum measurement range. Refer to **Chapter VII, Specification.**

Chapter III

Calibration


pH Calibration

The meter is capable of calibrating up to 3 points using USA or NIST (nSt) pH buffer standards or 2 points with Low Ionic (Pb) pH buffer standard. All new calibration values will automatically override existing data.

USA	pH 4.01, 7.00 and 10.01
NIST	pH 4.01, 6.86 and 9.18
Pb	pH 4.10 and 6.97

It is recommended that you perform at least a 2-point calibration at room temperature (25 °C) using standard buffers, starting with the first buffer at pH 7.00 (USA), pH 6.86 (NIST) or pH 6.97 (Pb) followed by other buffer values.


A 1-point calibration should be performed with a pH buffer value closest to the expected sample value being measured. Otherwise calibrating at pH 7.00, pH 6.86 or pH 6.97 is advisable.

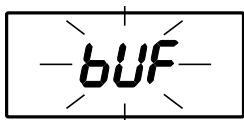
The meter has automatic buffer recognition that identifies the correct pH buffer values during calibration. If non-standard pH buffers other than the above standards are used, or the electrode has worn out, the LCD will flash “**Er1**”. Press the  to abort calibration and resume measurement. In general all pH buffer values have the window of up to ± 1 pH tolerance during calibration.





Ensure that you use new pH buffer solutions or sachets during calibration. Do not reuse buffer solutions as it may be contaminated and affect the calibration and accuracy of measurements. Always store buffer solutions in a dry, cool environment.

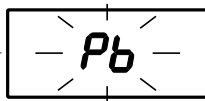
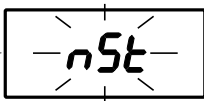
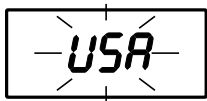
Before use, remove the plastic protective cap of pH electrode and condition the glass bulb by soaking it in tap water for 1-2 hours. This hydrates the glass bulb if electrode is too dry or has not been used for a long period of time. Always rinse the probes with tap water or rinse solution before and after each calibration/sample measurement to avoid cross-contamination. For details refer to **Chapter V, Electrode care and maintenance**.


Selection of pH buffer standards

You must set the meter to accept either USA, NIST (nSt) or Low Ionic (Pb) pH buffer standard values before calibration. The factory default is USA standard. If you wish to abort this operation press the  at any sequence and the meter reverts to pH measurement mode.







1. Press and hold the . Switch on the meter using . The display shows “**buf**” blinking.
2. Press  to get into the buffer selection mode. Use the  to toggle between USA, NIST or Pb standards as shown.





3. Press  to confirm your choice of buffer standard to be used. The display then reverts to the pH measurement mode.

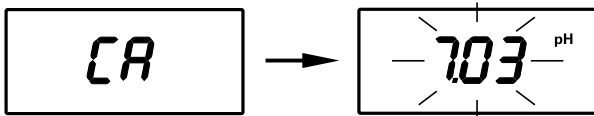
Resetting the User Calibrated Values



If you need to have a new set of Ion or pH measurements or mV offset (in pH 6) taken, you may wish to reset the last Ion/pH/mV calibrated values. Note only temperature offset (if set) will not be erased.

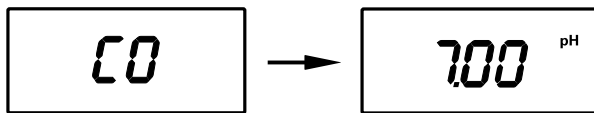
1. Press and hold the  while switching on the meter using the . The LCD shows “**rSt**” blinking.
2. Press  to abort this operation if you do not wish to reset.
3. Press  to confirm. The meter automatically clears all stored pH calibration or mV offset values and reverts to measurement mode.

pH Calibration using USA standard buffers

1. Pour a known pH buffer standard solution into a clean, dry container, e.g. pH 7.00. Power on the meter and it automatically enters into the measurement mode. Select pH mode by pressing  if necessary.
2. Dip both pH electrode and temperature probe into pH 7.00 buffer solution. Swirl gently and wait for reading to stabilize (approx. 30 seconds depending on your electrode condition).
3. Press  to enter pH calibration mode. A “CA” displays momentarily and the display shows the current uncalibrated reading flashing while in the calibration mode.





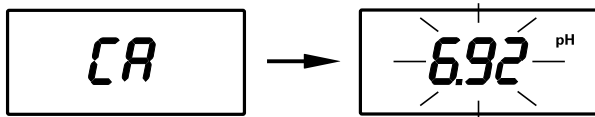
4. To abort or cancel calibration without accepting new value, press . The meter then reverts to pH measurement mode.
5. To proceed calibration, allow the reading to stabilize. The meter automatically recognizes pH 4.01, 7.00 or 10.01 buffers. Press  to confirm calibration and the LCD displays “CO” momentarily. The meter reverts to the measurement mode.





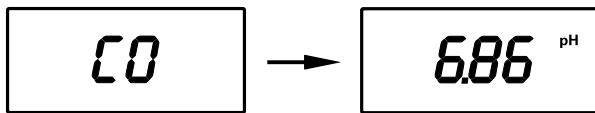
6. For 2 or 3-point calibration, repeat step 3 with other pH buffer values of 4.01 and/or 10.01 for higher accuracy.

pH Calibration using NIST standard buffers

1. Pour a known pH buffer standard solution into a clean container, e.g. pH 6.86. Power on meter, and it automatically enters into measurement mode. Select pH mode by pressing  if necessary.
2. Dip both pH electrode and temperature probe into pH 6.86 buffer solution. Swirl gently and wait for reading to stabilize (approx. 30 seconds depending on your electrode condition).
3. Press  to enter pH calibration mode. A “**CA**” displays momentarily and the display shows the current uncalibrated reading flashing while in the calibration mode.





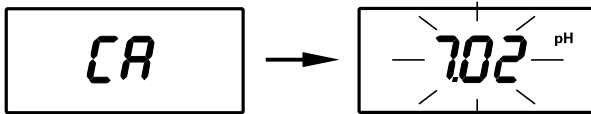
4. To abort or cancel calibration without accepting new value, press . The meter then reverts to pH measurement mode.
5. To proceed calibration, allow reading to stabilize. The meter automatically recognizes pH 4.01, 6.86 or 9.18 buffers. Press  to confirm calibration and the LCD displays “**CO**” momentarily. The meter reverts to measurement mode.





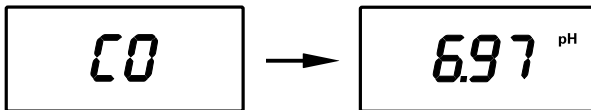
6. For 2 or 3-point calibration, repeat step 3 with other pH buffer values of 4.01 and/or 9.18 for higher accuracy.

pH Calibration using Pb standard buffers

1. Pour a known pH buffer standard solution into a clean container, e.g. pH 6.97. Power on the meter, and it automatically enters into measurement mode. Select pH mode by pressing .
2. Dip both pH electrode and temperature probe into pH 6.97 buffer solution. Swirl gently and wait for reading to stabilize (approx. 30 seconds depending on your electrode condition).
3. Press  to enter pH calibration mode. A “**CA**” displays momentarily and the display shows the current uncalibrated reading flashing while in the calibration mode.





4. To abort or cancel calibration without accepting new value, press . The meter then reverts to pH measurement mode.
5. To proceed calibration, allow reading to stabilize first. The meter automatically recognizes either pH 4.10 or 6.97 buffer. Press  to confirm calibration and the LCD displays “**CO**” momentarily. The meter reverts to measurement mode.

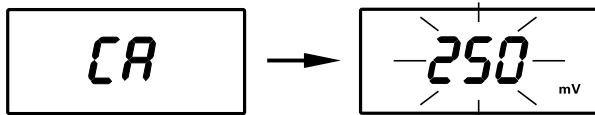






6. For 2-point calibration, repeat step 3 with pH 4.10 buffer for better accuracy.

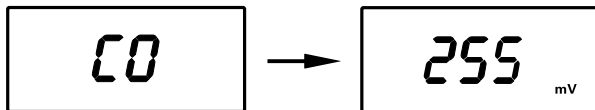
Millivolt (mV) Calibration

mV calibration is performed for ORP or Redox measurements, where you can adjust its mV value as a base value for measurements.

1. Press  to enter mV mode, the LCD displays "mV".
2. Dip the ORP electrode into a known standard solution, e.g. Quinhydrone 255 and swirl it until the reading stabilizes.
3. Press  to enter mV calibration. The LCD shows "CA" momentarily followed by displayed reading flashes.




4. To abort calibration press . Meter reverts to measurement mode.
5. To proceed with the calibration use  to adjust the reading to your desired value. The maximum adjustment you can make is ± 50 mV. Pressing  continuously allows you to scroll to the maximum allowable value and then loops back to the minimum allowable value.
6. Press  to confirm calibration. The display shows "CO" momentarily and meter reverts to measurement mode showing the current set value.




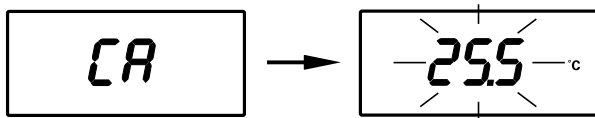
Temperature Calibration




With Temperature probe

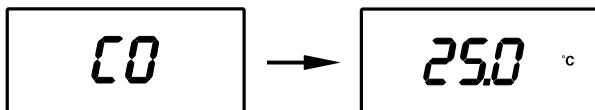
The temperature probe provided with the meter is factory-calibrated. Over time, temperature calibration may drift and require calibration. If there is a need to replace with the new probe you should calibrate the temperature probe prior to pH calibration.

1. Connect your temperature probe to the meter. Press  to enter the Temperature mode until “°C” annunciator appears in the LCD.
2. Compare the displayed value to a NIST certified thermometer or other thermometer known to be accurate. For best accuracy, place both the probe and thermometer in a constant temperature bath.

3. Press  to enter temperature calibration mode. The LCD shows “CA” momentarily and displayed reading flashes.





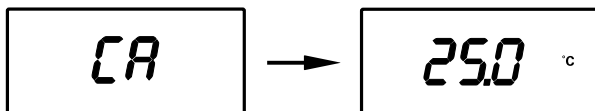
4. Press  until the LCD display shows the desired temperature. The meter allows an adjustable maximum value of ± 5 °C from factory default.
5. To cancel or abort this operation, press . Note no new value will be stored into the meter’s non-volatile memory. To confirm calibration, press . The LCD displays “CO” momentarily, and the meter reverts to measurement mode.






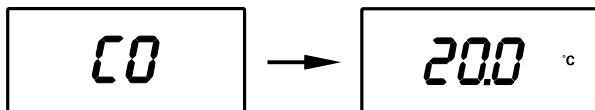
Without Temperature probe (no ATC)

If no temperature probe is used, the meter compensates for pH response based on a new calibrated temperature value manually set by you or at 25.0 °C (factory default).

1. Press  to enter into Temperature mode until "°C" shows in LCD.
2. Compare the displayed value to NIST certified thermometer or a thermometer known to be accurate (dipped into a constant temperature bath).
3. Press  to enter temperature calibration mode. The LCD shows "CA" momentarily and displayed reading flashes. Note that this displayed value should either be 25.0 °C or the last set temperature value.





4. Press  (for pH 5/6) until the displays shows the desired temperature. You can set any value from 0 to 100 °C.
5. To cancel or abort this operation, press . Note no new value will be stored into the meter's non-volatile memory. To confirm calibration, press . The LCD displays "CO" momentarily, and the meter reverts to measurement mode.



Chapter IV


Measurement

Taking Measurements


1. Before taking a measurement, rinse the pH/ORP electrode and temperature probe thoroughly with tap or distilled water to remove any impurities stuck onto the bodies of probes.
2. Power on the meter using . Press  to select your desired mode of operation (pH, mV, Ion or Temperature).
3. Dip and stir both probes gently into an aqueous test sample, swirl gently and wait for the reading to stabilize. Note the reading. Freeze the display if necessary, for details refer to **Releasing a Held Reading**.
4. Rinse the probes with tap water or rinse water thoroughly before taking the next sample measurement or storing them.

Holding a Reading



To freeze or hold your displayed reading momentarily, press  once. The LCD displays “HO” annunciator to indicate the HOLD function is activated.

Releasing a Held Reading

Press  once again to deactivate the HOLD function or to release your frozen reading. The meter reverts to the current measurement mode, and the “HO” annunciator disappears from the LCD.

Chapter V

Electrode Care and Maintenance

For best results, always keep the pH/ORP electrode bulb wet. Store the pH/ORP glass bulb with pH electrode storage solution. Other pH buffers are also suitable. NEVER use deionized water for storage. Wash the probe thoroughly with distilled water after each use. Because your pH electrode is susceptible to contamination or dirt, clean it every 1 to 2 months depending on the extent and condition of use.

Clean the pH/ORP electrode using a mild detergent. Wipe the probe with a soft tissue paper. Avoid touching the glass membrane with your fingers. Wash thoroughly in tap water and then in distilled water. Recalibrate the meter after cleaning the electrode.

Chapter VI

Troubleshooting

Problem	Cause	Solution
No display	Batteries not in place	a. Insert batteries b. Re-insert batteries in correct polarity
“LO” displays in the LCD	Low battery	Replace batteries with fresh ones
Unstable reading	a. Electrode not deep enough in sample b. Dirty electrode c. Broken electrode	a. Place electrode deeper in sample b. Clean electrode and recalibrate. c. Replace electrode
“Er1” display	Buffer value out of tolerance	Use new pH buffer solution and recalibrate
“Er2” display	Single point calibration	Perform at least 2 point calibration
Not able to calibrate	a. Display freezes b. Faulty electrode	a. Release reading by pressing HOLD key b. Replace electrode

Chapter VII

Specification

Specification	
pH Range	0.00 to 14.00 pH
Resolution	0.01 pH
Accuracy	± 0.01 pH
pH Slope Range	80 to 120%
No. of Calibration Pts	1 to 3 points (push-button)
Buffer Options	pH 4.01, 7.00, 10.01 (USA) pH 4.01, 6.86, 9.18 (NIST) pH 4.10, 6.97 (Pb)
Temperature Range	0.0 to 100.0 °C
Resolution	0.1 °C
Accuracy	± 0.5 °C
Temperature Comp.	Automatic / Manual (0 to 100 °C)
Millivolt Range	-1000 to +1000 mV
Resolution	1 mV
Accuracy	± 2 mV
Features	
Auto-Buffer Recognition	as above pH buffer options
Hold Function	“HO”
Auto Shut Off	After 17 minutes
Low Battery Indication	“LO”
Display	Single Custom LCD
Operating Temperature	0 to 50 oC
Power Requirements	4 x “AAA” Alkaline Batteries
Battery Life	500 hours
Meter Dim./Weight	14 x 7 x 3.5 cm / 200 g

Chapter VIII

Accessories

Replacement Meter Accessories

Cat. No.	Item
9142BN	Glass-body pH Combination Reference Electrode, Single Junction, 12 x 120 mm* (1 m cable length).
9146BN	Epoxy-body pH Combination Electrode, Single Junction, 12 x 120 mm* (1 m cable length)
9147BN	Epoxy-body pH/Temperature Combination Gel Electrode, Single Junction, 12 x 90 mm (1 m cable length)
917004	Epoxy-body pH/Temperature Combination Electrode, Double Junction, 3 x 80 mm (1 m cable length)
910001	pH Electrode Storage Solution, 475 mL
900020	pH Electrode Cleaning Solution Kit, includes one bottle each of A, B, C, D cleaner, 15 mL beaker & pipette
900011	Ag/AgCl Reference Filling Solution, 5 x 60 mL (for 9142BN)

* Dimensions are from bottom of cap.

Replacement Solution

Cat. No.	Item
910104	pH 4.01 buffer, 475 mL bottle (1 pint)
910107	pH 7.00 buffer, 475 mL bottle (1 pint)
910110	pH 10.01 buffer, 475 mL bottle (1 pint)
910686	pH 6.86 buffer, Din, 475 mL bottle (1 pint)
910918	pH 9.18 buffer, Din, 475 mL bottle (1 pint)
910460	pH 4.01 buffer, 60 mL x 5 bottles
910760	pH 7.00 buffer, 60 mL x 5 bottles
9116860	pH 1.68 buffer, Din, 60 mL x 5 bottles
9191860	pH 9.18 buffer, Din, 60 mL x 5 bottles
911060	pH 10.01 buffer, Din, 60 mL x 5 bottles
700402	pH 4.10 buffer, 475 mL x 4 bottles
700702	pH 6.97 buffer, 475 mL x 4 bottles
911110	pH rinse solution pouches, 15 mL x 10 pcs.
911125	pH rinse solution pouches, 15 mL x 25 pcs.
910410	pH 4.01 buffer pouches, 15 mL x 10 pcs.
910425	pH 4.01 buffer pouches, 15 mL x 25 pcs
910725	pH 7.00 buffer pouches, 15 mL x 25 pcs
911025	pH 10.01 buffer pouches, 15 mL x 25 pcs

Chapter IV

Terms and Conditions

General

Seller hereby offers for sale to the buyer ("Buyer") the products herein (the "Products") on the express condition that Buyer agrees to accept and be bound by the terms and conditions set forth herein. Any provisions contained in any document issued by Buyer are expressly rejected and if the terms and conditions in this Agreement differ from the terms of Buyer's offer, this document shall be construed as a counter offer and shall not be effective as an acceptance of Buyer's document. Buyer's receipt of Products or Seller's commencement of the services provided hereunder will constitute Buyer's acceptance of this Agreement. This is the complete and exclusive statement of the contract between Seller and Buyer with respect to Buyer's purchase of the Products. No waiver, consent, modification, amendment or change of the terms contained herein shall be binding unless in writing and signed by Seller and Buyer. Seller's failure to object to terms contained in any subsequent communication from Buyer will not be a waiver or modification of the terms set forth herein. All orders are subject to acceptance in writing by an authorized representative of Seller.

Warranty

Thermo Electron warranty for Russell products covers failures due to manufacturer's workmanship or material defects from the date of purchase by the user. User should return the warranty card to Thermo Electron and retain proof of purchase. Warranty is void if product has been abused, misused, or repairs attempted by unauthorized persons.

Warranties herein are for product sold/installed by Thermo Electron or its authorized dealers.

Any product sold by a U.S. or Canadian distributor must be returned to Thermo Electron for any warranty work. Please contact our Technical Service department for further information. A Return Authorization Number must be obtained from Thermo Electron Technical Service before returning any product for in-warranty repair or replacement. In the event of failure within the warranty period, Thermo Electron will at Thermo Electron's option, repair or replace product not conforming to this warranty. There may be additional charges, including freight, for warranty service performed in some countries. For service, call Thermo Electron (or its authorized dealer outside the United States and Canada). Thermo Electron reserves the right to ask for proof of purchase, such as the original invoice or packing slip.

The following products are warranted to be free from defects in material and workmanship in the period listed below from the date of purchase from the user or from the date of shipment from Thermo Electron, whichever is earlier, provided use is in accordance with the operating limitations and maintenance procedures in the instruction manual and when not having been subjected to accident, alteration, misuse, abuse or breakage of electrodes:

Twenty-four months from date of purchase by the user (or thirty-six months from date of shipment from Thermo Electron)

All Russell RL060P and RL060C meters.

Six months from date of purchase by the user

Thermo Electron pH probes 9142BN, 9146BN, 9147BN; ATC probe 917004; conductivity probe 014005.

Warranty also includes failure for any reason (excluding breakage), except abuse, provided the electrode is not used in solutions containing silver, sulfide, perchlorate, or hydrofluoric acid; or in solutions more than one (1) Molar in strong acid or base at temperatures above 50 °C.

“Out-of-Box” Warranty - Should any of the following products fail to work when first used, contact Thermo Electron immediately for replacement.

THE WARRANTIES DESCRIBED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM THE COURSE OF DEALING OR USAGE OF TRADE. THE BUYER'S SOLE AND EXCLUSIVE REMEDY IS FOR REPAIR OR REPLACEMENT OF THE NON-CONFORMING PRODUCT OR PART THEREOF, OR REFUND OF THE PURCHASE PRICE, BUT IN NO EVENT SHALL THERMO ELECTRON (ITS CONTRACTORS AND SUPPLIERS OF ANY TIER) BE LIABLE TO THE BUYER OR ANY PERSON FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHETHER THE CLAIMS ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE), OR OTHERWISE WITH RESPECT TO OR ARISING OUT OF THE PRODUCT FURNISHED HEREUNDER. REPRESENTATION AND WARRANTIES MADE BY ANY PERSON, INCLUDING ITS AUTHORIZED DEALERS, REPRESENTATIVES AND EMPLOYEES OF THERMO ELECTRON WHICH ALTER OR ARE IN ADDITION TO THE TERMS OF THIS WARRANTY SHALL NOT BE BINDING UPON THERMO ELECTRON UNLESS IN WRITING AND SIGNED BY ONE OF ITS OFFICERS.

Limitation of Liability

NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, THE LIABILITY OF SELLER UNDER THESE TERMS AND CONDITIONS (WHETHER BY REASON OF BREACH OF CONTRACT, TORT, INDEMNIFICATION, OR OTHERWISE, BUT EXCLUDING LIABILITY OF SELLER FOR BREACH OF WARRANTY (THE SOLE REMEDY FOR WHICH SHALL BE AS PROVIDED UNDER SECTION 2 ABOVE)) SHALL NOT EXCEED AN AMOUNT EQUAL TO THE LESSER OF (A) THE TOTAL PURCHASE PRICE THERETOFORE PAID BY BUYER TO SELLER WITH RESPECT TO THE PRODUCT(S) GIVING RISE TO SUCH LIABILITY OR (B) ONE MILLION DOLLARS (\$1,000,000). NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES (INCLUDING WITHOUT LIMITATION DAMAGES FOR LOSS OF USE OF FACILITIES OR EQUIPMENT, LOSS OF REVENUE, LOSS OF DATA, LOSS OF PROFITS OR LOSS OF GOODWILL), REGARDLESS OF WHETHER SELLER (A) HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES OR (B) IS NEGLIGENT.

Miscellaneous

(a) The rights and obligations of the parties hereunder shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, without reference to its choice of law provisions. Each party hereby irrevocably consents to the exclusive jurisdiction of the state and federal courts located in Suffolk County, Massachusetts, in any action arising out of or relating to this Agreement and waives any other venue to which it may be entitled by domicile or otherwise. (b) In the event of any legal proceeding between the Seller and Buyer relating to this Agreement, neither party may claim the right to a trial by jury, and both parties waive any right they may have under applicable law or otherwise to a right to a trial by jury. Any action arising under this Agreement must be brought within one (1) year from the date that the cause of action arose.

Chapter X

Declaration of Conformity

Manufacturer: Thermo Electron Corporation

Address: 166 Cummings Center
Beverly, MA 01915
USA

The above named Manufacturer hereby declares that the product(s) described below conforms to the Standards and Directives listed below:

pH RL060P portable meter

Directive / Standard

89/336/EEC Electromagnetic Compatibility (EMC) Directive

EMC essential requirements for measurement device:

EN 50081-1 /1992: EN 55011
EN 50082-1 /1997: EN 61000-4-2/-3

These products have been manufactured in compliance with the provisions of the relevant Thermo Electron manufacturing and test documents and processes. Further, these documents and processes are recognized as complying with ISO 9001:2000 by QMI, listed as File #001911.

Place and date of issue:
Beverly, MA,
November 10, 2005



Robert Manning
Manager of Quality

Chapter XI

Assistance

After troubleshooting all components of your measurement system, contact The Technical EdgeSM for Orion products. Within the United States call 1.800.225.1480, outside the United States call 978.232.6000 or fax 978.232.6031. In Europe, the Middle East and Africa, contact your local authorized dealer. For the most current contact information, visit www.thermo.com/water or email info.water@thermo.com.

Chapter XII

WEEE Compliance



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC . It is marked with the following symbol:

Thermo Electron has contracted with one or more recycling/disposal companies in each EU Member State and this product should be disposed of or recycled through them. Further information on Thermo Electron's compliance with these Directives, the recyclers in your country, and information on Thermo Electron products which may assist the detection of substances subject to the RoHS Directive are available at www.thermo.com/WEEERoHS.



Thermo Electron Corporation

Environmental Instruments
Water Analysis Instruments

166 Cummings Center
Beverly, MA 01915 USA
Tel: 978-232-6000
Toll Free: 800-225-1480
Dom. Fax: 978-232-6015
Int'l. Fax: 978-232-6031

www.thermo.com/water