

**Model 570
pH, mV and
Temperature Meter**

JENWAY

Operating Manual

Safety

Please read this information carefully prior to installing or using this equipment.

1. The unit described in this manual is designed to be operated only by trained personnel. Any adjustments, maintenance and repair must be carried out as defined in this manual, by a person qualified to be aware of the hazards involved.
2. It is essential that both operating and service personnel employ a safe system of work, in addition to the detailed instructions specified in this manual.
3. Other than for those items defined in the maintenance procedures herein there are no user serviceable items in this instrument. Removal of covers and attempted adjustment or service by unqualified personnel will invalidate the warranty and may incur additional charges for repair.
4. References should always be made to the Health and Safety data supplied with any chemicals used. Generally accepted laboratory procedures for safe handling of chemicals should be employed.
5. If it is suspected that safety protection has been impaired in any way, the unit must be made inoperative and secured against any intended operation. The fault condition should immediately be reported to the appropriate servicing authority.

Merci de lire attentivement ces informations avant d'installer ou d'utiliser cet appareil.

1. L'appareil décrit dans ce manuel est conçu pour être utilisé uniquement par des personnes formées. Tout réglage, maintenance ou réparation doit être effectué comme décrit dans ce manuel, par une personne qualifiée consciente des risques encourus.
2. Il est essentiel que les personnes utilisant et intervenant sur cet appareil respectent les règles de sécurité de travail, en plus des instructions détaillées précisées dans ce manuel.
3. En-dehors des éléments décrits dans les procédures de maintenance ci-incluses, cet appareil ne contient aucun élément réparable par l'utilisateur. L'enlèvement des capots et les tentatives de réglage ou de réparation par des personnes non qualifiées invalide toute garantie et entraîne un risque de frais de réparation supplémentaires.

4. Toujours se référer aux fiches techniques de santé et de sécurité accompagnant tout produit chimique utilisé. Respecter les procédures de laboratoire généralement acceptées pour la manipulation en toute sécurité des produits chimiques.
5. Si l'utilisateur suspecte qu'un problème quelconque puisse mettre en cause la sécurité, l'appareil doit être rendu inopérant en empêchant son utilisation. Communiquer la défaillance constatée au service de maintenance compétent.

Bitte lesen Sie diese Hinweise vor Installation oder Gebrauch dieser Ausrüstung sorgfältig durch.

1. Das in diesem Handbuch beschriebene Gerät darf nur von geschultem Personal bedient werden. Alle Anpassungen, Wartungsarbeiten und Reparaturen müssen entsprechend der Vorgaben in diesem Handbuch und von einer kompetenten Person, die mit den damit verbundenen Gefahren vertraut ist, durchgeführt werden.
2. Es ist wichtig, dass sowohl das Bedienungs- als auch das Service-Personal zusätzlich zu den detaillierten Anweisungen in diesem Handbuch ein sicheres Arbeitssystem einsetzen.
3. Mit Ausnahme der Teile, deren Wartungsverfahren in diesem Handbuch beschrieben sind, enthält dieses Gerät keine weiteren Teile, die vom Benutzer gewartet werden können. Das Entfernen von Abdeckungen und Versuche von hierfür unqualifiziertem Personal, Anpassungen oder Wartungsarbeiten durchzuführen, haben zur Folge, dass die Garantie verfällt und können zusätzliche Reparaturkosten auslösen.
4. Es ist jederzeit auf die sicherheitsrelevanten Daten sämtlicher verwendeter Chemikalien Bezug zu nehmen. Alle dazu vorhandenen Informationen, Hinweise und Warnungen zur Handhabung, Lagerung, Verwendung und Entsorgung müssen genauestens beachtet werden. Allgemein anerkannte Labormethoden zum sicheren Umgang mit Chemikalien sollten eingesetzt werden. Es ist jederzeit angemessene Sicherheitsausrüstung und persönliche Schutzausrüstung zu verwenden.
5. Besteht der Verdacht, dass die Sicherheitsvorrichtungen in irgendeiner Weise beschädigt wurden, muss das Gerät außer Betrieb genommen und gegen weiteren Gebrauch gesichert werden. Die Störung sollte der zuständigen Serviceeinrichtung unverzüglich gemeldet werden.

Leggere attentamente queste istruzioni prima di installare o utilizzare il dispositivo.

1. L'unità descritta nel presente manuale è stata realizzata per essere utilizzata solo da personale che ha ricevuto l'apposita formazione. Qualsiasi operazione di regolazione, manutenzione e riparazione deve essere effettuata sulla base di quanto indicato nel presente manuale da personale qualificato consapevole dei rischi connessi.
2. È fondamentale che il personale operativo e il personale addetto alla manutenzione utilizzino un sistema di lavoro sicuro, oltre a seguire le istruzioni specificate nel presente manuale.
3. Oltre a quelli indicati nelle procedure di manutenzione, all'interno di questo dispositivo non sono presenti altri elementi sui quali è possibile effettuare interventi. La rimozione delle protezioni e qualsiasi tentativo di regolazione o di manutenzione posto in essere da personale non qualificato invaliderà la garanzia. In questi casi, sarà necessario pagare un importo per le riparazioni effettuate.
4. È sempre necessario fare riferimento ai dati sulla salute e sulla sicurezza forniti con le sostanze chimiche utilizzate. Tutte le informazioni, i consigli e gli avvertimenti disponibili sulla manipolazione, la conservazione, l'uso e lo smaltimento devono essere rispettati attentamente. Adottare le procedure di laboratorio generalmente accettate per la gestione delle sostanze chimiche. Utilizzare sempre attrezzature protettive personali e di sicurezza adeguate.
5. Nel caso in cui si sospetti che la salute possa essere pregiudicata in qualsiasi modo, disattivare l'unità per renderla inutilizzabile. Qualsiasi condizione di errore deve essere immediatamente segnalata al responsabile per la manutenzione.

Lea esta información atentamente antes de instalar o utilizar este equipo.

1. La unidad descrita en este manual está diseñada para que solamente la utilice personal con formación. Cualquier operación de ajuste, mantenimiento y reparación debe llevarse a cabo del modo indicado en este manual y debe realizarla una persona cualificada que sea consciente de los peligros que implica.

2. Es fundamental que tanto los operarios como el personal de servicio utilicen un sistema de trabajo seguro, así como las instrucciones detalladas que se especifican en este manual.
3. Cualquier elemento que no se encuentre entre los definidos en los procedimientos de mantenimiento aquí descritos no podrá utilizarse en este instrumento. La extracción de las tapas y los intentos de ajuste o reparación por parte de personal no cualificado invalidarán la garantía y pueden incurrir en cargos adicionales por reparación.
4. Siempre deberían consultarse los datos sobre Salud y Seguridad que se suministran con cualquier producto químico que se utilice. Deben respetarse atentamente todas las indicaciones, recomendaciones y advertencias disponibles en relación con la manipulación, el almacenamiento y la eliminación de los productos. Es necesario llevar a cabo los procedimientos de laboratorio de aceptación generalizada para la manipulación segura de productos químicos. Se deben utilizar en todo momento los equipos adecuados de seguridad y protección personal.
5. Si existe la sospecha de que las medidas protectoras de seguridad han quedado dañadas en cualquier modo, la unidad debe inutilizarse y protegerse contra toda operación que se intente llevar a cabo. El estado de fallo debe comunicarse inmediatamente a la autoridad de servicio de mantenimiento y reparación pertinente.

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SECTION 1 - Introduction

1.1 INSTRUMENT DESCRIPTION

Model 570 is a general purpose handheld pH, mV and temperature meter offering 2 point calibration and automatic buffer recognition. This model simultaneously displays either temperature compensated pH readings or electrode potential and temperature.

1.2 INSTRUMENT SPECIFICATION

| Model | 570 |
|--------------------------------------|---------------------------------------|
| Type | pH, mV and temperature |
| Waterproof | Yes (IP67) |
| pH Range | -2 to 16pH |
| pH Resolution | 0.01pH |
| pH Accuracy | +/- 0.02pH |
| mV Range | -1000 to 1000mV |
| mV Resolution | 1mV |
| mV Accuracy | +/-1mV |
| ATC | 0 to 100°C |
| Temperature Range | -39.9 to 149.9°C |
| Temperature Resolution | 0.1°C |
| Temperature Accuracy | +/-0.4°C (-10 to 70°C) |
| No. of Calibration Points | 2 |
| Automatic Buffer Recognition | Yes – 4, 7 and 10 pH |
| Auto Shut Off | 10 mins |
| Operating Temperature | 0 to 100°C |
| Battery Life (hours) | 2500 |
| pH Connector | BNC |
| Temperature Connector | Waterproof Lumberg screw-locking type |
| Dimensions (l x w x d) | 141 x 71 x 32mm |
| Weight | 230g |
| Instrument Warranty | 2 years |
| Electrode/Temperature probe Warranty | 6 months |

SECTION 2 - Installation

2.1 UNPACKING

Remove the 570 meter from the packaging and ensure the following items are included:

Model 570 pH and temperature meter (570 271)

Epoxy bodied combination pH electrode (924 001)

Temperature probe (170 101)

pH 4, 7 and 10 buffer sachets

3 x AAA alkaline batteries (fitted)

Instruction manual (570 350)

Jenway Foreign Manual CD (JENMANCD)

2.2 INSTALLATION

Connect the electrode to the BNC socket on the instrument and remove the protective cap covering the electrode. Connect the temperature probe to the connector on the instrument and remove the protective sheath. Press the ON/OFF key to turn the instrument on.

2.3 DISPLAY AND CONTROLS

The pH meter has an LCD display which displays either the temperature compensated pH readings or electrode potential and temperature simultaneously. The keypad used for this meter enables an easy and effective way of calibrating and performing a measurement.



Fig. 2.3.1 – Display and Controls

1. Display showing pH or electrode potential and temperature reading
2. BNC connector for pH electrode
3. Connector for temperature probe
4. UP arrow Key for adjusting values
5. DOWN arrow Key for adjusting values
6. On/Off key
7. MODE key to change the display between pH or mV and temperature (single press), changing between °C and °F units (long press)
8. Calibration and Backlight key for calibrating the instrument and switching on the backlight respectively

The instrument will switch off automatically after 10 minutes of inactivity (i.e. no key presses). To disable the auto-off function press and hold the Up arrow key whilst switching the unit on. "Auto-off disable" will be displayed across the screen. When the unit is turned off the auto-off function will be re-enabled.

To change the instrument temperature units between °C and °F, press and hold the MODE key for 3 seconds.

When the instrument is turned on a single press of the CAL and backlight key will turn the backlight on. Another press will switch the backlight off. When the backlight is on it will automatically turn off after 10 seconds. If the low battery icon is showing the backlight function will not work.

If mV is selected instead of pH the instrument will read the voltage generated by a pH, redox or ion type electrode within the range of $\pm 1000\text{mV}$.

SECTION 3 - Temperature Adjustment

Model 570 is supplied with a temperature probe enabling automatic temperature compensation to be used. If the probe is disconnected then manual temperature compensation can be used instead.

3.1 MANUAL TEMPERATURE ADJUSTMENT

If the temperature probe is disconnected 'MANUAL' will be displayed above the temperature value. To manually adjust the temperature press or hold the Up or Down arrow keys to adjust the temperature in whole degrees.

Note that manual temperature adjustment can only be performed if the temperature probe is not connected.

3.2 AUTOMATIC TEMPERATURE CORRECTION (ATC)

When the temperature probe is connected the 570 meter will automatically detect the connection and the temperature will be displayed continuously on the screen. The pH reading will be automatically compensated depending on the temperature of the sample being measured. The ATC range is 0 to 100°C (32 to 212°F). If the temperature probe is removed the temperature will be displayed for 10 seconds.

'Hi Temp Err' is displayed if the readings are above 100°C.

'Lo Temp Err' is displayed if the readings are below 0°C.

SECTION 4 - Calibration and Measurement

Before performing a measurement the instrument must be calibrated. It is recommended that the instrument is calibrated daily to achieve consistent and accurate results. Model 570 has a 2 point calibration process. The first calibration point MUST be buffer pH 7.00. The second calibration point depends on the acidity of the solution which is to be measured. For samples with a pH around 5 the second calibration point should be 4.01 pH buffer. For samples with a pH around 8 the second calibration point should be 10.01pH buffer. Always rinse the pH and temperature probes in de-ionised water before placing in each buffer solution. If the ATC probe is connected the instrument automatically compensates for the resulting change in electrode response due to temperature during the calibration process.

Press the ON/OFF key to switch the instrument on. If the temperature probe is not connected 'MANUAL' will be displayed above the temperature value. If manual temperature adjustment is being used, the temperature of the solution must be measured using a thermometer so that the temperature can be manually adjusted.

Place the pH electrode and temperature probe into 7.00 pH buffer solution and allow the reading to stabilise. Stir then press and hold down the CAL key for 3 seconds. Auto-Cal will flash up on the display and then the current reading will be displayed. Once the reading has stabilised press the CAL key, rinse the electrode and temperature probe in deionised/distilled water and place them into 4.01 pH or 10.01 pH solution and allow the reading to stabilise, again stir the solution to remove any air bubbles. To finish press the CAL key, 'Calibrated Ok' will flash up and the display will show the solution value of the buffer.

To abort the calibration point at any point press the ON/OFF key and the meter will revert back to any previous calibration values.

During the calibration process the instrument will automatically detect the buffer solution. However if you know the exact pH value for the buffer at a given temperature (temperature coefficient) you can change the offset BS (buffer solution 7.00pH) and slope BS (buffer solution 4.01 or 10.01) by using the Up or Down arrow keys. Refer to your calibration solutions/capsules temperature coefficients before any alterations are carried out.

'**FAIL**' will be shown if 7.00 pH buffer isn't used as the first calibration point.

If the electrode and buffer solution's combined error is greater than 0.5 pH or 30mV then '**Error I/P**' will be displayed and the calibration aborted. If the electrode and buffer solution's combined error is greater than 30mV then '**FAIL**' will be displayed and the calibration aborted. If the electrode and buffer solution's combined slope error (4.01 or 10.01) is greater than 0.5pH or 15% '**Slope error**' will be displayed. If the slope error is greater than 15% the '**FAIL**' will be displayed.

If an error is displayed during a correctly performed pH calibration this can be investigated using the mV reading from the pH electrode to determine if the electrode needs to be replaced. With the instrument in mV mode place the clean/conditioned electrode and temperature probe into buffer pH 7.00 at a temperature of 25°C and leave for 30 seconds to stabilise. Record the mV reading (Asymmetry Potential). Rinse the electrode and temperature probe in distilled or deionised water, blot and repeat the process in buffer pH 4.01. Record the mV reading and calculate the difference between the two to obtain the span.

Example:

Reading at 7.00 pH: 4 mV

Reading at 4.01 pH: 178 mV

Span = $178 - 4 = 174\text{mV}$

In order to calculate the slope percentage (Condition), divide the calculated span by the theoretical span and times it by 100. The theoretical span between 7.00 pH and 4.01 pH is 176.9 mV.

Slope % = $174/176.9 \times 100 = 98\%$

If your results are below 85% or your mV reading exceeds $\pm 30\text{mV}$ at 7pH, then you will need to replace the electrode.

Once the instrument is calibrated the sample can be measured. Place the pH electrode and temperature probe into the sample and allow to stabilise.

If 'Over Range pH Err' is displayed the readings are higher than 16pH or 1000mV.

If 'Under Range pH Err' is displayed the readings are below -2pH or -1000mV.

If 'No Probe Err' is displayed the pH electrode is not connected.

SECTION 5 - Care and Maintenance

Over time the electrode sensor will degrade, but regular calibrating, cleaning and the correct storage will prolong its life. The epoxy bodied combination electrode supplied with this instrument is suitable for the majority of tests carried out in aqueous solutions. For other applications, such as low ionic strength, Tris buffers, high temperatures and strongly acidic solutions a more suitable pH/reference electrode pair may be required. Details or advice are supplied on request (jenwayhelp@bibby-scientific.com).

If the electrode readings are slow or erratic, place the electrode into cleaning solution or 7.00 pH solution for at least half an hour to one hour before testing again. The temperature probe and pH electrodes are not waterproof and cannot be fully immersed in water. It is recommended that the instrument is calibrated daily to achieve consistent and accurate results.

The following general guidelines indicate the care and maintenance required:

Always rinse the pH electrode with cleaning solution or deionised water before next use.

Electrodes should be stored:

- away from direct sunlight
- in a vertical position
- within their specified temperature range

Always ensure the electrode is used within its specified temperature range. Ageing of electrodes used above their specified temperature is rapid and irreversible.

DO NOT touch the sensitive glass pH membrane or reference junction. 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.

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

5.1 BATTERY REPLACEMENT

Replace the battery when the battery icon is low.

This meter will continue to measure accurately but after further usage the meter will display 'FLAt bAT' and shutdown.

Unscrew the screws on the back of the meter and replace with three AAA batteries ensuring that the polarities are correct.

SECTION 6 - Accessories and Spare Parts

6.1 OPTIONAL ACCESSORIES

| Part Code | Description |
|------------------|--|
| 025 037 | pH 4 buffer (red, 500ml) |
| 025 038 | pH 7 buffer (yellow, 500ml) |
| 025 039 | pH 10 buffer (blue, 500ml) |
| 025 179 | pH 4 buffer sachets (pack of 10) |
| 025 180 | pH 7 buffer sachets (pack of 10) |
| 025 181 | pH 10 buffer sachets (pack of 10) |
| 025 192 | pH electrode storage solution (250ml) |
| 025 161 | pH electrode cleaning solution (500ml) |

6.2 SPARES

| Part Code | Description of Spare Part |
|------------------|----------------------------------|
| 924 001 | Epoxy bodied electrode |
| 170 101 | Temperature probe |
| 033 275 | Carry Case |

SECTION 7 – Service and Support

7.1 SERVICE

Our dedicated service staff are on hand to help in the unlikely event that your Jenway equipment develops a fault. Please contact them by one of the following means with a clear description of the problem:

E-mail: service@bibby-scientific.com

Tel: +44 (0) 1785 810475

Fax: +44 (0) 1785 810471

On occasion it may be necessary for your equipment to be sent back to our Service Department for repair. In this case please contact the Service Department for a reference number which you should include with your faulty equipment. Please also ensure you include a clear description of the fault and a completed copy of our Decontamination Certificate. This is available as a downloadable pdf file at www.jenway.com, or contact us and we will be happy to send you a copy. Please clearly mark the package for the attention of the Service Department and post to the following address:

Bibby Scientific Ltd
Beacon Road
Stone
Staffordshire
ST15 0SA
United Kingdom

All replacement parts are guaranteed for 6 months and where ever possible, returned equipment is turned around in 5 working days.

7.2 TECHNICAL SUPPORT

Jenway have a dedicated Technical Support team made up of experienced scientists who are on hand to help with any applications advice and questions you may have about our products and how to use them. If you require any technical or application assistance please contact the team at:

E-mail: jenwayhelp@bibby-scientific.com Phone: +44 (0)1785 810433

SECTION 8 – Declaration of Conformity

Declaration of Conformity

pH Meter, Model 570

This product complies with the requirements of the EU Directives listed below:

2004/108/EC EMC Directive.

2011/65/EC RoHS Directive

CE mark affixed 2016.

Signed:  (Mr S. Marriott)

Date: 2/3/16

Authority: Technical Director
Bibby Scientific Ltd



Bibby Scientific Ltd - Stone - Staffs - ST15 0SA - UK
Tel: +44 (0) 1785 812121 - Fax +44 (0) 1785 813748



Bibby Scientific UK

Beacon Road,
Stone,
Staffordshire
United Kingdom ST15 0SA
Tel: +44 (0) 1785 812121
Fax: +44 (0) 1785 810405
Email: sales@bibby-scientific.com
Web: www.bibby-scientific.com