



GP353 - General Purpose pH Meter - Users Manual

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SECTION 1 - Introduction

Description

The GP353 is a simple-to-operate, bench pH meter. The meter can be calibrated to one or two points, offers manual or automatic temperature compensation and can be used to measure pH, mV and temperature.

Unpacking

Verify that you have received all equipment. If you have any questions about the shipment, please call EDT Direct ION Ltd. or your agent.

When you receive the shipment, inspect the container for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the agent.

Note

The carrier will not honour any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material in the event that re-shipment be necessary.

The following items are packed in the box:

GP353 Meter • E8050 Temperature Probe • E8060 Electrode Stand
AC Adapter • 9V Battery • pH Buffers 4,7,10 • Operator's Manual

Setting Up - AC Operation

Only use the approved power adaptor supplied

Check that the adaptor is the correct voltage for your power supply

Plug the adaptor into the power socket at the back of the meter, then connect to the AC supply.

Battery Installation

Approximately 24 hours of continuous use is afforded by the 9V battery.

The BAT flag appears on the display to indicate a low battery.

To install or replace the battery, slide off the back cover

Remove the old battery and insert a new one ensuring that the polarity is correct

Replace back cover.

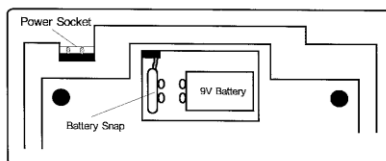


Figure 1. Bottom view of instrument showing power connections

Instrument Test Procedure

1. Ensure that the shorting plug is connected to the BNC pH input at the back of the meter and that the temperature probe is removed.
2. Switch the Mode dial to pH mode
3. The displayed reading should lie between 6.00 and 8.00pH units
4. Adjust the Cal control until the display reads 7.00pH and remains stable.
5. The meter is ready for calibration

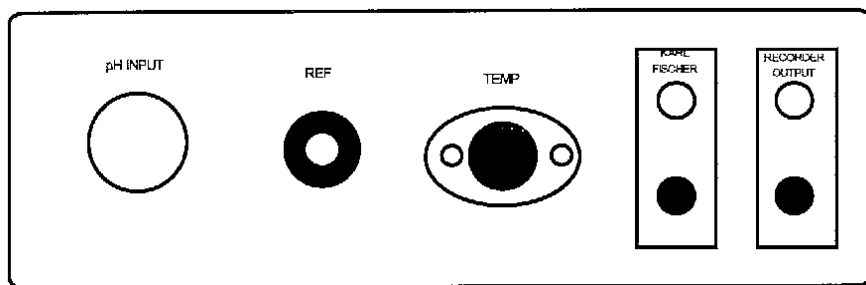


Figure 2. Rear view of GP353

A Note on Electrodes

Combination pH electrodes (reference and sensing electrode in one body) or two half-cells (reference and sensing electrodes separate) may be used with the GP353. Combination or pH half-cells should have a BNC terminal and be connected to the socket marked pH input at the back of the meter. Reference half-cells should have a 4mm bunched terminal and be connected to the socket marked REF. Always refer to electrode instructions before use. See also, Appendix 1.

pH Buffers

See Appendix 1

Section 2 - pH Calibration and Measurement

For accurate results, stir all buffers and samples. Always rinse electrodes and blot dry before transferring from one solution to another to prevent contamination. Ensure that any electrode filling holes are left uncovered during use.

Automatic Temperature Compensation

1. Connect the pH electrode(s) and temperature probe and turn the mode switch to °C
2. Place the pH electrode(s) and the temperature probe in the first buffer, and note the temperature of the solution. Refer to the temperature chart on the buffer (or see Appendix 1) and note the correct value of the buffer at the noted temperature.
3. Turn the mode switch to pH mode. Wait for the reading to stabilise. Using the CAL control, adjust the reading to the value obtained in step 2.
4. Place the pH electrode(s) and temperature probe in the second buffer. Again establish the correct value for the temperature of measurement. When the reading is stable, adjust to the correct value using the Slope control.
5. Automatically temperature compensated readings may now be made by immersing the pH electrode(s) and temperature probe into the sample and recording the stabilised reading.

Manual Temperature Compensation

If use of a temperature probe is inappropriate (e.g. small sample size), then it is possible to use manual temperature compensation).

1. Disconnect temperature probe.
2. Measure the temperature of the buffer with a thermometer.
3. Switch to °C mode and adjust the reading to the correct value using the Temp °C control.
4. Refer to the temperature chart on the buffer (or see Appendix 1) to establish the correct buffer value for the temperature of measurement.
5. Follow the procedure given above for Automatic Temperature Compensation, points 3. to 5. above, measuring and adjusting the temperature manually for each buffer and sample.

No Temperature Compensation

For accurate results with no temperature compensation, the temperature of all buffers and samples should be equal and remain constant.

1. With the temperature probe disconnected, switch the instrument to °C mode and set the displayed reading to the temperature of measurement using the Temp °C control.
2. Switch to pH mode, place the electrode(s) in the first buffer, wait for the reading to stabilise and enter the correct value (given on the buffer packet or in Appendix 1) using the CAL control.
3. Place the electrode(s) in the second buffer. When the reading is stable, adjust to the correct value using the Slope control.
4. Place the electrode(s) in the sample and record the stabilised reading.

Section 3 - mV Calibration and Measurement

Absolute mV

- 1. Switch the mode dial to mV
- 2. Connect the shorting plug to the BNC input and adjust the CAL control until the display reads 000mV
- 3. Remove shorting plug and connect electrode(s).
- 4. Absolute mV readings may now be made by immersing the electrodes in the sample and recording the reading.

Relative mV

- 1. Switch the Mode dial to mV
- 2. Connect electrode(s)
- 3. Immerse electrode(s) in the standard or blank solution and adjust the CAL control until the display reads 0mV. (Note, the maximum offset is 60mV).
- 4. mV values relative to the standard solution may now be taken by immersing in the sample and recording the reading.

Section 4 - Use of the recorder output

- 1. Connect the recorder via the red and black 4mm sockets on the back panel. (Red positive, Black negative)
- 2. Ensure that the recorder is set for the appropriate range, as shown below.

MODE	RANGE (mV)	DISPLAY	RECORDER
pH	0-200	7.00pH	70.0mV
mV	±200	500mV	50.0mV
°C	±200	25.0°C	25.0mV

Section 5 - Troubleshooting

In the event of a malfunction, it is important to pinpoint the problem to either the meter or the cell. If a spare cell is available, substitute it for the one in use.

There are no user serviceable parts in this instrument. Please ensure that the instrument, together with all accessories, is returned to EDT Direct ION Ltd or the agent with a full description of the symptoms.

No attempt should be made to repair the meter.

Symptom	Probable Cause
No display	Battery is flat or not installed Power supply disconnected
'BAT' flag displayed	Battery Low
Wildly erratic readings or display reads -- on left hand side	Electrodes disconnected Electrodes not immersed in solution Reference electrode not filled Reference junction dry
Drifting readings	Inconsistent or lack of stirring Reference filling solution contaminated Buffers contaminated
Erratic/drifting readings or display reads -- on left hand side when shorting plug is attached.	Return meter for servicing

Section 6 - Specifications

pH Range	-2 to 19.99
pH Resolution	0.01pH
pH Accuracy	±0.02pH
Temperature Compensation	0-100°C
Manual Calibration	2 points at any value
mV Range	±2000mV
mV Resolution	1mV
mV Accuracy	±2% ±1 digit
°C Range	-100 to +200°C
°C Resolution	0.1°C
°C Accuracy	±0.5°C
Recorder Output	0-200mV
Karl Fischer Output	10µA
Display	12.7mm LCD
Power	9V Battery or AC
Instrument Size	210 x 150 x 88mm
Instrument Weight	550g

Appendix 1 - pH electrodes

Before Use

Remove the protective cap covering the glass sensing bulb and replace with the protective guard if applicable. Inspect the filling solution for air bubbles and remove by shaking in a downward direction. Soak the electrode in pH storage solution for 30 minutes.

Cleaning

Soak the electrode in 0.1M HCl for 15 minutes followed by soaking in pH storage solution for 30 minutes

Storage.

Put some pH storage solution in the protective cap and place over the glass bulb. Never store the electrode in distilled or de-ionised water. Never allow the electrode to dry out.

pH electrode storage solution is made up by dissolving 1g KCl in 100mL of pH 7 buffer

pH Buffers - Buffer Capsules

Buffer capsules are made up as follows For each buffer, empty the powder into a suitable container. Using deionised water, make up to 100mL ensuring that the powder is fully dissolved before use. The coloured outer skin may be added to colour code the resulting buffer. This may take up to 4 hours to dissolve but will not affect the pH of the buffer.

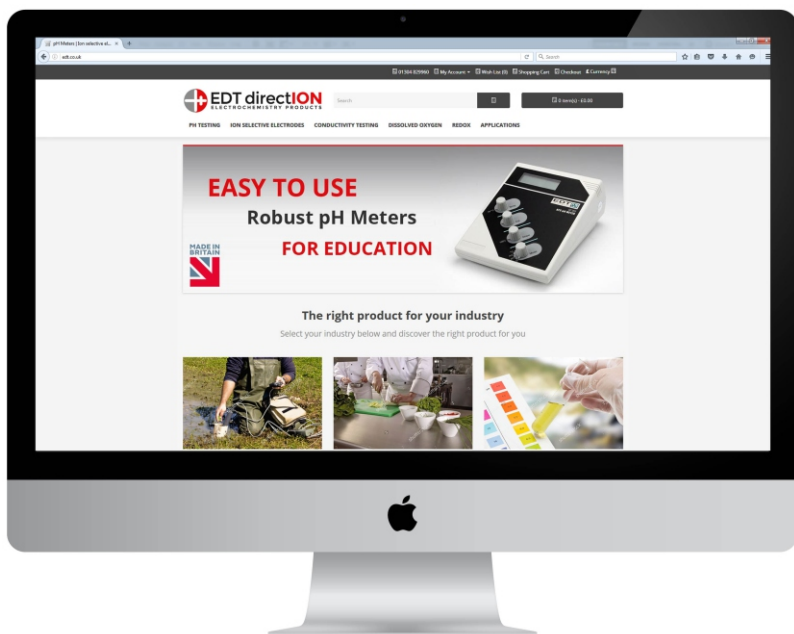
Buffer Solutions

If using ready made solutions, use ones supplied with temperature coefficient information.

Table of Temperature Coefficients For EDT Buffers

°C	pH	4 pH	7 pH	pH10
10		3.99	7.07	10.18
15		4.00	7.04	10.14
20		4.00	7.02	10.06
25		4.00	7.00	10.00
30		4.00	6.99	9.95
35		4.01	6.98	9.91
40		4.02	6.97	9.85
50		4.05	6.96	9.78
60		4.07	6.96	9.75

For more information on our products
please visit our website www.edt.co.uk



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