

CODE: GZ9100228214C

Instruction Manual for DO Tip 5401

Thank you for your purchasing a HORIBA DO tip. Read this manual carefully before using the electrode tip.

Precautions on Use

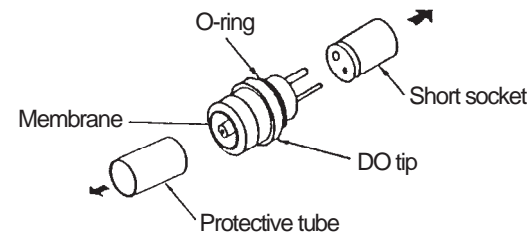
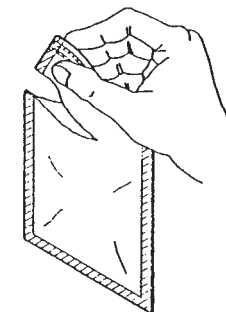
- Be careful not to scratch membrane.
DO tip is covered with extremely thin fragile membrane. Do not damage it by hitting or pushing DO tip strongly.
- Ensure complete waterproofing.
DO tip mounted on sensor body is designed to prevent infiltration of sample by means of O-ring. Make sure that O-ring is fitted to DO tip, and tighten it to the sensor body securely.
- Do not touch the inner solution.
The inner solution is strongly alkaline. If it sticks to your cloth or skin, wash it away with water sufficiently. The cornea of an eye is weak to alkali. Do not to allow any droplet of inner solution to contact eyes in particular.

Storage

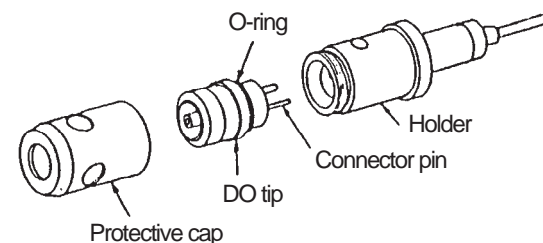
- Connect the short socket before storage.
When storage of independent DO tip is intended, remove DO tip from the holder. Be sure to connect DO tip to the short socket, and store it in a cool dark place.

Mounting procedure

- ① Take a DO tip out of a pack.
The pack has a notch at its edge.
Tear the pack from there, and take out DO tip.
- ② Detach the protective tube.
Remove cellophane tape, and detach the protective tube.
- ③ Disconnect the short socket.



- ④ Attach DO tip to the holder.
Insert the DO tip into the holder in the correct direction, caring the difference of the two connector pins in diameter size, and then screw and fix the protective cap to the holder.



Keep the protective tube and short socket after detaching them from DO tip; you will need them for storing DO tip afterwards.

For any question regarding this product, please contact your local agency, or inquire from the Customer Registration website (<http://www.horiba.com/contact-us/>)

HORIBA, Ltd.

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CODE: GZ9100228245D

Instruction Manual for DO Tip 7541

Thank you for your purchasing a HORIBA DO tip. Read this manual carefully before using the tip.

Precautions on handling

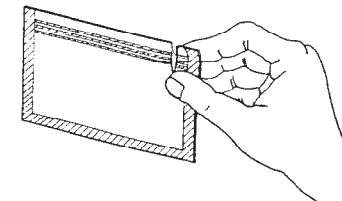
- Be careful not to scratch membrane.
DO tip is covered with extremely thin fragile membrane. Do not damage it by hitting or pushing DO tip strongly.
- Ensure complete waterproofing.
DO tip mounted on sensor body is designed to prevent infiltration of sample by means of O-ring.
- Do not touch the inner solution.
The inner solution is strongly alkaline. If it sticks to your cloth or skin, wash it away with water sufficiently. The cornea of an eye is weak to alkali. Do not to allow any droplet of inner solution to contact eyes in particular.

Storage

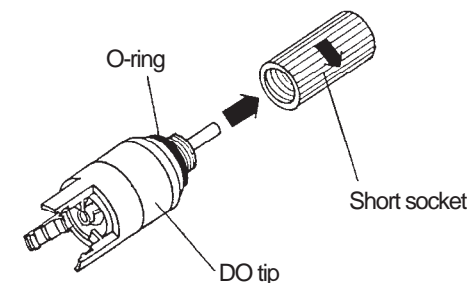
- Connect the short socket before storage.
When storage of independent DO tip is intended, remove DO tip from DO electrode body.
Be sure to connect DO tip to the short socket, and store it in a cool dark place.

Mounting procedure

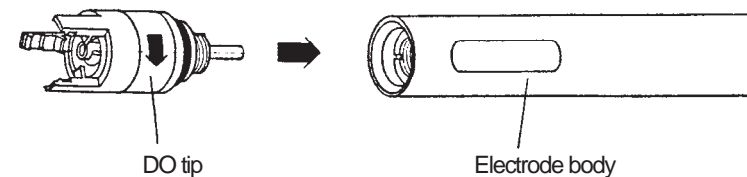
- ① Take a DO tip out of a pack.
The pack has a notch at its edge.
Tear the pack from there, and take out DO tip.



- ② Disconnect the short socket.



- ③ Attach DO tip to DO electrode body.



Keep the short socket after detaching it from DO tip; you will need it for storing DO tip afterwards.

DO Electrode (9520-10D) Operation Manual

Thank you for purchasing a HORIBA DO electrode.
Read this Operation Manual carefully before using the electrode.
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参 考
Reference Only

1 Cautions during handling

- The D-20 Series of pH meters can be used in combination with this electrode to provide water-resistant construction (conforming to IP-67). When measuring, do not immerse the cap, lead or connector in the sample.
- Do not allow the electrode to come in contact with any hard surface.
- An extremely thin membrane is stretched across the DO tip and DO responsive part. DO not allow the membrane to come in contact with any hard surface and do not exert undue force on the membrane.
- The internal solution of the DO tip is a strong alkaline. If the internal solution comes in contact with your clothes or skin, flush immediately with water. If the internal solution comes in contact with your eyes, flush immediately with large amounts of water and seek treatment by a physician.
- When attaching the DO tip to the electrode body, check to make sure that the O-ring is attached. Attach the DO tip securely to the electrode body.
- The electrode connector requires a high degree of insulation. Do not allow the connector to come in contact with water or dirty hands.
- DO tips that are no longer usable should be disposed of as industrial waste.

2 Contents

- Electrode body 1 pc.
- DO tip (#7541) 1 pc.
- Sensor adapter (common taper fit for \$ 19) 1 pc.
- Stirrer 1 pc.
- Stirrer casing 1 pc.
- Operation Manual 1 copy

3 Specifications and names of parts

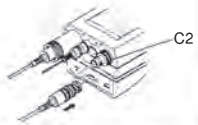
Model: 9520-10D

Specifications	Measurement principles	Membrane galvanic cell
	Measurement range	0 - 19.99 mg/l
Names of parts	Usable temp. range	0 - 45 °C
	Wetted materials	PVC, POM, epoxy, FEP, CR, silicon rubber
	Dimensions:	
	Electrode length	190 mm (incl. cap)
	Ext. diam. of wetted part	15 mm
	Lead length	1 m

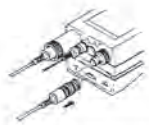
4 Preparations

4.1 Connecting to pH meter

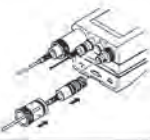
- Insert the electrode connector into the connector port sleeve on the meter, after aligning with the pin. Do not insert the connector unless it is aligned properly with the connector port.



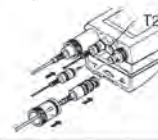
- Press the electrode connector into the connector port on the meter, while turning the connector to the right.



- Slide the connector cover over the connector. Then, screw the cover to the right until it comes in light contact with the meter case.



- Insert the temperature connector into the jack on the meter. Insert the connector firmly, until the O-ring on the connector can no longer be seen.



Note ▶▶▶ With a D-25 pH meter, the C2 and T2 connectors are used for the DO electrode. The C1 and T1 connectors are reserved for pH or ORP electrodes, only.

4.2 Preparing electrode



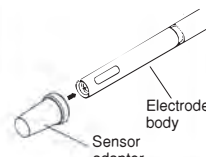
Caution

Chemical solution

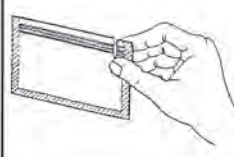
Highly concentrated potassium hydroxide (KOH) is used in the internal solution of the electrode. If the internal solution in the electrode comes in contact with your hands or skin, wash immediately with water. If the internal solution comes in contact with your eyes, flush immediately with large amounts of water and seek treatment by a physician.

- The sensor adapter is used to make the container being used air-tight during BOD measurement, when it is extremely important that the sample contained in a furan bottle during measurement not absorb any oxygen from the air, or when storing a DO electrode in zero sample solution inside a conical flask.

- Attach the sensor adapter to the electrode body.

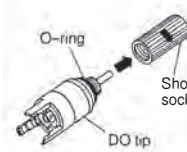


- Remove the DO tip (#7541) from its packaging.

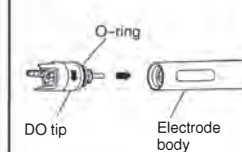


Note ▶▶▶ An O-ring is attached inside the sensor adapter, so push the sensor adapter in with a little force, while turning it.

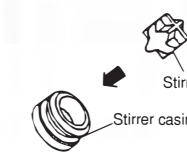
- Remove the DO tip short socket.



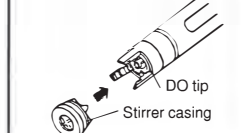
- Push the DO tip securely into the electrode body, to attach it.



- Put the stirrer into the stirrer casing.



- Put the stirrer casing onto the DO tip, so that it clicks into place.



Note ▶▶▶ Do not dispose of the short socket that was removed. It is necessary when storing the electrode.

Note ▶▶▶ When attaching the DO tip to the electrode body, make sure that the O-ring is attached to the DO tip.

5 Points to remember when measuring (calibrating)

Air calibration

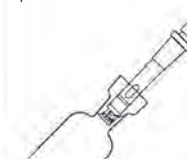
- Remove any drops of liquids from the membrane at the tip of the DO electrode, by wiping away the liquid with soft tissue paper or similar material to make it dry.
- Avoid calibrating in places with extreme temperature fluctuation, places exposed to the wind or rain, and places near heating equipment.
- Do not grasp the holder during or immediately before/after calibration. (Body temperature adversely affects the stability of the readings.)

Note ▶▶▶ Equalizing the temperatures of the DO electrode and the air is important in achieving proper air-calibration. If possible, allow the DO electrode to sit in the open air for a short time (approx. 20 minutes) prior to calibration.

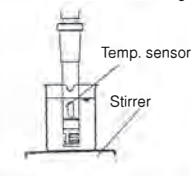
Standard solution calibration and sample measurement

- Wash the electrode in pure (ion exchange) or tap water and dry it with filter or tissue paper, each time prior to immersing it in the solution.
- When immersing the electrode in the solution, be sure that the temperature sensor is completely immersed.
- Stir the DO electrode around in the solution, so that the temperature of the electrode becomes the same as that of the solution.
- Make sure the membrane has no dirt or air bubbles on it.
- Measure the DO of the solution, making sure the flow speed on the surface of the membrane is constant.

- Immerse the electrode into the solution at an angle, so air bubbles do not cling to the DO tip membrane.



- Start the stirrer, setting it for approx. 1,000 rpm or more to stabilize the DO meter reading.

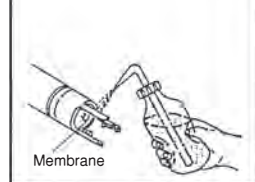


6 Maintenance

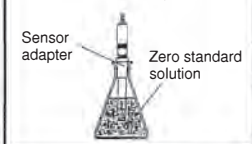
- After finishing measurement, wash the DO electrode well in pure (ion exchange) water, then keep it immersed in a conical flask containing zero standard solution (approx. 5% sodium sulfite solution). Leave the electrode connected to the meter.

Note ▶▶▶ If the electrode is stored for a long period of time without being connected to the pH meter, it may be difficult to stabilize the reading when preparing for to make measurements.

- Wash the DO electrode well with pure (ion exchange) water.



- Immerse the electrode in a conical flask containing zero standard solution (approx. 5% sodium sulfite solution).



- If the electrode membrane is dirty, clean it by using soft cotton gauze, using care not to scratch the membrane. Then, rinse the membrane with pure (ion exchange) water.

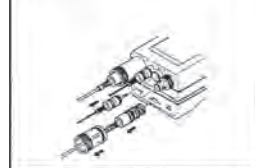
- If an error occurs during calibration, replace the DO tip.

Note ▶▶▶ As a DO electrode is used, white sedimentation may develop in the internal solution of the DO tip. This does not affect performance.

7 Storage

- The electrode should, as a principle, be stored while remaining connected to the meter.
- To store the electrode without the pH meter, follow the below procedure.

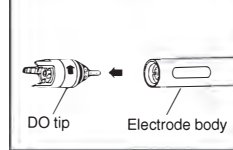
- Remove the electrode from the connector on the meter.



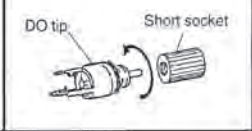
- Wash the electrode well with pure (ion exchange) water, then dry it with cotton gauze.



- Remove the DO tip from the electrode body.



- Screw the short socket onto the DO tip, then store it in a cool, dark location.



Note ▶▶▶ Avoid storing the electrode in a hot place or places with high humidity. Store the electrode indoors, out of direct sunlight.

Thank you for purchasing a HORIBA DO electrode. Read this Operation Manual carefully before using the electrode.

1 Cautions during handling



CAUTION

Chemical solution

Highly concentrated potassium hydroxide (KOH) is used in the internal solution of the electrode. If the internal solution in the electrode comes in contact with your hands or skin, wash immediately with water. If the internal solution comes in contact with your eyes, flush immediately with large amounts of water and seek treatment by a physician.

- Do not allow the electrode to come in contact with any hard surface.
- An extremely thin membrane is stretched across the DO tip and DO responsive part. DO not allow the membrane to come in contact with any hard surface and do not exert undue force on the diaphragm.
- When attaching the DO tip to the electrode body, check to make sure that the O-ring is attached. Attach the DO tip securely to the electrode body.
- The electrode connector requires a high degree of insulation. Do not allow the connector to come in contact with water or dirty hands.
- DO tips that are no longer usable should be disposed of as industrial waste.
- The water-resistant construction of pH meters can be used in combination with this electrode to provide water-resistant construction (conforming to IP-67). When measuring, do not immerse the cap, lead or connector in the sample.

2 Contents

- Holder 1 pc.
- DO tip (#5401) 1 pc.
- Operation Manual 1 copy
- Electrode strap 1 pc.

3 Specifications and names of parts

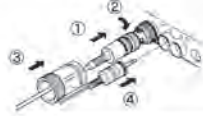
• **Model: 9551-20D (100D)**

Specifications	Measurement principles	Membrane galvanic cell
	Measurement range	0 mg/L to 19.99 mg/L
Names of parts	Usable temp. range	0°C to 40°C
	Wetted materials	SCS-14, FEP, PVC, FKM, CR, NBR
	Dimensions:	
	Electrode length	165 mm (incl. cap)
	Ext. diam. of wetted part	32 mm
	Lead length	2 m (100D: 10 m)

4 Preparations

4.1 Connecting to pH meter

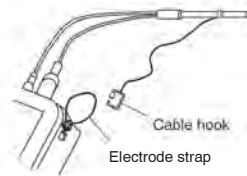
- Insert the electrode connector into the connector port sleeve on the meter, after aligning with the pin. Do not insert the connector unless it is aligned properly with the connector port.
- Press the electrode connector into the connector port on the meter, while turning the connector to the right.
- Slide the connector cover over the connector. Then, push the cover in straight until it comes in light contact with the meter case. Do not turn the cover.
- Insert the temperature connector into the jack on the meter. Insert the connector firmly, until the O-ring on the connector can no longer be seen.



- Attach the electrode strap to the pH meter.



- Attach the cable hook to the electrode strap.



Note▶▶▶ Be sure to attach the cable hook to the electrode strap. If not, the cable may break.

Note▶▶▶ Attach the electrode strap to the side hole adjacent to the connector port for DO electrode.

4.2 Preparing electrode

<p>1 Remove the protective cap from the holder.</p>	<p>2 Remove the DO tip (#5401) from the package.</p>
<p>3 Remove the protective cap from the DO tip.</p>	<p>4 Remove the short socket from the DO tip.</p>
<p>5 Attach the DO tip to the holder.</p>	<p>6 Attach the protective cap securely to the holder.</p>

Note▶▶▶ Do not dispose of the short socket that was removed. It is necessary when storing the electrode.

Note▶▶▶ The DO tip connector has a thick pin and a thin pin. Insert the DO tip connector into the holder, making sure the thick and thin pins are aligned correctly. Screw the protective cap on firmly, until it stops. When attaching the DO tip to the electrode body, make sure that the O-ring is attached to the DO tip.

5 Points to remember when measuring (calibrating)

• **Air calibration**

- Remove any drops of liquids from the membrane at the end of the DO tip, by wiping away the liquid with soft tissue paper or similar material to make it dry.
- Avoid calibrating in places with extreme temperature fluctuation, places exposed to the wind or rain, and places near heating equipment.
- Do not grasp the holder during or immediately before/after calibration. (Body temperature adversely affects the stability of the readings.)

Note▶▶▶ Equalizing the temperatures of the DO electrode and the air is important in achieving proper air-calibration. If possible, allow the DO electrode to sit in the open air for a short time (approx. 20 minutes) prior to calibration.

• **Standard solution calibration and sample measurement**

- Wash the electrode with tap water and dry it with filter or tissue paper, each time prior to immersing it in the solution.
- When immersing the electrode in the solution, be sure that the temperature sensor is completely immersed.
- Stir the DO electrode around in the solution, so that the temperature of the electrode becomes the same as that of the solution.

- Make sure the membrane has no dirt or air bubbles on it.
- Measure the DO of the solution, making sure the flow speed on the surface of the membrane is constant.

<p>1 Wash the electrode with tap water and dry it with filter or tissue paper, each time prior to immersing it in the solution</p>	<p>2 Measure the DO while moving the electrode up and down (at a speed of approx. 20 cm/s to 30 cm/s).</p>
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Note▶▶▶ The electrode membrane is thin and easily torn. Place it into solution slowly.

Note▶▶▶ Do not cause any damage to the lead and electrode when immersing the electrode in the solution.

Note▶▶▶ Do not shake the electrode holding the lead in your hand, and do not pull or tie the lead.

6 Maintenance

- After finishing measurement, wash the DO electrode well with tap water, then keep it immersed in tap water. Leave the electrode connected to the pH meter.
- If the electrode membrane is dirty, clean it by using soft cotton gauze, using care not to scratch the membrane. Then, rinse the membrane with tap water.
- If an error occurs during calibration, replace the DO tip.

7 Storage

- The electrode should, as a principle, be stored while remaining connected to the meter.
- To store the electrode without the pH meter, follow the below procedure.

<p>1 Remove the electrode from the connector on the pH meter.</p>	<p>2 Wash the electrode well with tap water, then dry it with cotton gauze.</p>
<p>3 Remove the DO tip from the holder.</p>	<p>4 Put the short socket on the DO tip, then store it in a cool, dark location.</p>

Note▶▶▶ Avoid storing the electrode in hot place or places with high humidity. Store the electrode indoors, out of direct sunlight.

* "DO" is an abbreviation of Dissolved Oxygen.

DO Electrode (9551-20D/100D) Operation Manual

Thank you for purchasing a HORIBA DO electrode. Read this Operation Manual carefully before using the electrode.

1 Cautions during handling



CAUTION

Chemical solution

Highly concentrated potassium hydroxide (KOH) is used in the internal solution of the electrode. If the internal solution in the electrode comes in contact with your hands or skin, wash immediately with water. If the internal solution comes in contact with your eyes, flush immediately with large amounts of water and seek treatment by a physician.

- Do not allow the electrode to come in contact with any hard surface.
- An extremely thin membrane is stretched across the DO tip and DO responsive part. DO not allow the membrane to come in contact with any hard surface and do not exert undue force on the diaphragm.
- When attaching the DO tip to the electrode body, check to make sure that the O-ring is attached. Attach the DO tip securely to the electrode body.
- The electrode connector requires a high degree of insulation. Do not allow the connector to come in contact with water or dirty hands.
- DO tips that are no longer usable should be disposed of as industrial waste.
- The water-resistant construction of pH meters can be used in combination with this electrode to provide water-resistant construction (conforming to IP-67). When measuring, do not immerse the cap, lead or connector in the sample.

2 Contents

- Holder 1 pc.
- DO tip (#5401) 1 pc.
- Operation Manual 1 copy
- Electrode strap 1 pc.

3 Specifications and names of parts

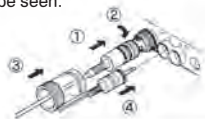
Model: 9551-20D (100D)

Specifications	Measurement principles	Membrane galvanic cell
	Measurement range	0 mg/L to 19.99 mg/L
Names of parts	Usable temp. range	0°C to 40°C
	Wetted materials	SCS-14, FEP, PVC, FKM, CR, NBR
	Dimensions:	
	Electrode length	165 mm (incl. cap)
	Ext. diam. of wetted part	32 mm
	Lead length	2 m (100D: 10 m)

4 Preparations

4.1 Connecting to pH meter

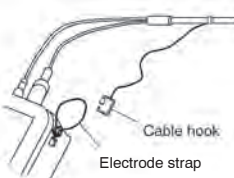
- Insert the electrode connector into the connector port sleeve on the meter, after aligning with the pin. Do not insert the connector unless it is aligned properly with the connector port.
- Press the electrode connector into the connector port on the meter, while turning the connector to the right.
- Slide the connector cover over the connector. Then, push the cover in straight until it comes in light contact with the meter case. Do not turn the cover.
- Insert the temperature connector into the jack on the meter. Insert the connector firmly, until the O-ring on the connector can no longer be seen.



- Attach the electrode strap to the pH meter.



- Attach the cable hook to the electrode strap.



Note▶▶▶ Be sure to attach the cable hook to the electrode strap. If not, the cable may break.

Note▶▶▶ Attach the electrode strap to the side hole adjacent to the connector port for DO electrode.

4.2 Preparing electrode

1 Remove the protective cap from the holder. 	2 Remove the DO tip (#5401) from the package.
3 Remove the protective cap from the DO tip. 	4 Remove the short socket from the DO tip.
5 Attach the DO tip to the holder. 	6 Attach the protective cap securely to the holder.

Note▶▶▶ Do not dispose of the short socket that was removed. It is necessary when storing the electrode.

Note▶▶▶ The DO tip connector has a thick pin and a thin pin. Insert the DO tip connector into the holder, making sure the thick and thin pins are aligned correctly. Screw the protective cap on firmly, until it stops. When attaching the DO tip to the electrode body, make sure that the O-ring is attached to the DO tip.

5 Points to remember when measuring (calibrating)

• Air calibration

- Remove any drops of liquids from the membrane at the end of the DO tip, by wiping away the liquid with soft tissue paper or similar material to make it dry.
- Avoid calibrating in places with extreme temperature fluctuation, places exposed to the wind or rain, and places near heating equipment.
- Do not grasp the holder during or immediately before/after calibration. (Body temperature adversely affects the stability of the readings.)

Note▶▶▶ Equalizing the temperatures of the DO electrode and the air is important in achieving proper air-calibration. If possible, allow the DO electrode to sit in the open air for a short time (approx. 20 minutes) prior to calibration.

• Standard solution calibration and sample measurement

- Wash the electrode with tap water and dry it with filter or tissue paper, each time prior to immersing it in the solution.
- When immersing the electrode in the solution, be sure that the temperature sensor is completely immersed.
- Stir the DO electrode around in the solution, so that the temperature of the electrode becomes the same as that of the solution.

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- Make sure the membrane has no dirt or air bubbles on it.
- Measure the DO of the solution, making sure the flow speed on the surface of the membrane is constant.

1 Wash the electrode with tap water and dry it with filter or tissue paper, each time prior to immersing it in the solution. 	2 Measure the DO while moving the electrode up and down (at a speed of approx. 20 cm/s to 30 cm/s).
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Note▶▶▶ The electrode membrane is thin and easily torn. Place it into solution slowly.

Note▶▶▶ Do not cause any damage to the lead and electrode when immersing the electrode in the solution.

Note▶▶▶ Do not shake the electrode holding the lead in your hand, and do not pull or tie the lead.

6 Maintenance

- After finishing measurement, wash the DO electrode well with tap water, then keep it immersed in tap water. Leave the electrode connected to the pH meter.
- If the electrode membrane is dirty, clean it by using soft cotton gauze, using care not to scratch the membrane. Then, rinse the membrane with tap water.
- If an error occurs during calibration, replace the DO tip.

7 Storage

- The electrode should, as a principle, be stored while remaining connected to the meter.
- To store the electrode without the pH meter, follow the below procedure.

1 Remove the electrode from the connector on the pH meter. 	2 Wash the electrode well with tap water, then dry it with cotton gauze.
3 Remove the DO tip from the holder. 	4 Put the short socket on the DO tip, then store it in a cool, dark location.

Note▶▶▶ Avoid storing the electrode in hot place or places with high humidity. Store the electrode indoors, out of direct sunlight.

* "DO" is an abbreviation of Dissolved Oxygen.