Operating Instructions

for

pH/Redox Electrodes

(Combination Electrodes)

Model: APS-Z/APK-Z/ARS-Z

APS-Z/APK-Z/ARS-Z

1. Contents

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

If you encounter difficulties during startup, please do not interfere with the electrode in any way that is impermissible. By doing so, you could endanger your rights under the instrument warranty. Please contact your supplier.

- Each electrode is a quality product and is individually tested and packaged.
- Storage should be in a dry room at -5 to +30°C. Because pH and redox electrodes have limited suitability for storage, we do not recommend storing them for longer than 6 months.
- All electrodes are provided with a rinsing cap or container for transport and storage to prevent the sensor elements from drying out.
- The electrode should be kept in a 3mol/l solution of KCl.
- If the electrode has been stored dry for an extended time, however, it must be conditioned before being used for measurements. For this purpose, the electrode is immersed in a 3mol/l solution of KCl for about 24 hours.
- The pH-sensitive membrane glass must be handled carefully (no skin contact, protect against damage, etc.)!
- Make certain that electrical connections and cables are kept clean and dry.

If you send the electrode back, we need a brief description of the fault:

- o Electrode cannot be calibrated
- o Display is not stable
- o Other fault:

Electrodes must not be allowed to dry out during use or storage!
Do not keep the electrode in distilled water!

3mol / l KCl
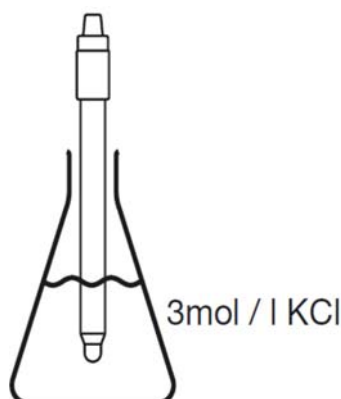
3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:
- pH/Redox Electrodes (Combination Electrodes)   model: APS-Z/APK-Z/ARS-Z

4. Regulation Use

Any use of the device, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Sensor installation

- Electrodes must be installed vertically. The maximum angle to the vertical is 80°.
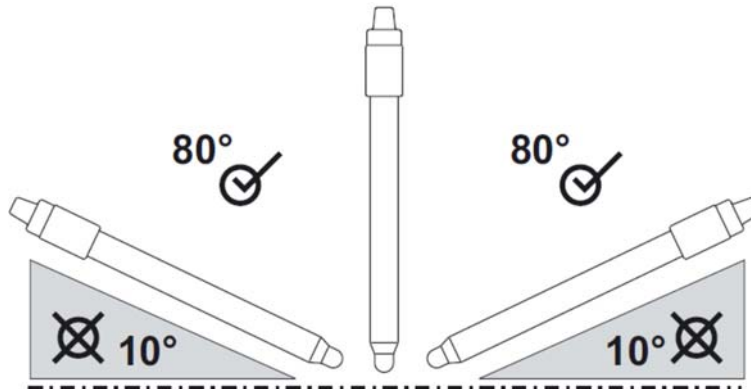
- The internal buffer must cover the inside surface of the membrane glass. Air bubbles in the membrane chamber must be removed by light shaking of the electrode in the vertical.

6. Calibration and measuring

Always follow the instructions in the manual for the transmitter you are using as well!

- When a new pH electrode is placed in operation with a measurement amplifier, a calibration must be performed.
- Typically, a two-point calibration is required for pH electrodes. Two standard buffer solutions are required (for example pH 7.0 and 4.0). Usually, the buffer solutions are selected to bracket the later measurement range.

Rinse off the electrode with water between measurements!

First Step

Connect the pH/redox electrode with the transmitter and immerse it in a buffer or test solution (for example pH 7.0 or 468 mV).

- With manual temperature entry, adjust the temperature of the buffer solution on the measuring instrument.
- Wait until the display value for the pH/redox (and temperature) has stabilized. Then adjust the pH/redox value of the first buffer/test solution on the transmitter.

Rinse off the pH electrode with deionized water and carefully dry it with a soft cloth.
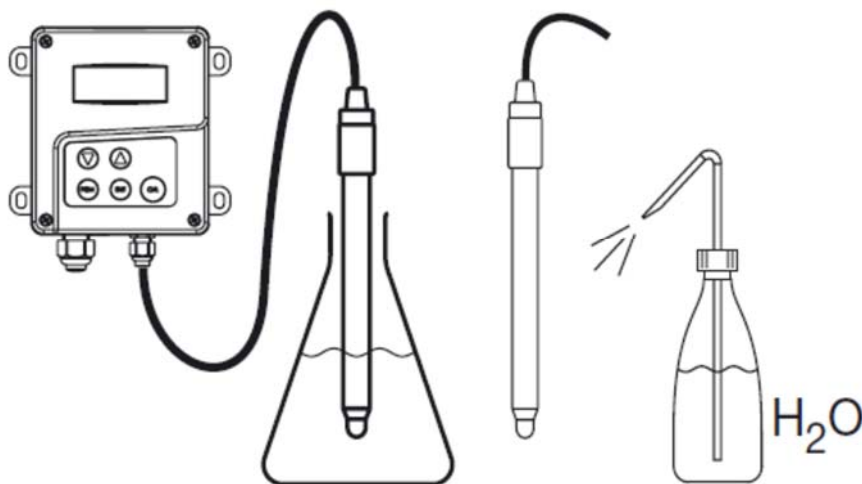
For redox electrodes the calibration is now complete

Second step

- Immerse the pH electrode in a second buffer solution (for example pH 4.0 or 10.0) and wait until the display value has stabilized. Then enter the pH value of the second buffer solution.
- The measuring instrument determines the zero point and slope of the sensor.
- Rinse off the electrode with deionized water and carefully dry it with a soft cloth.
- The calibration is complete.
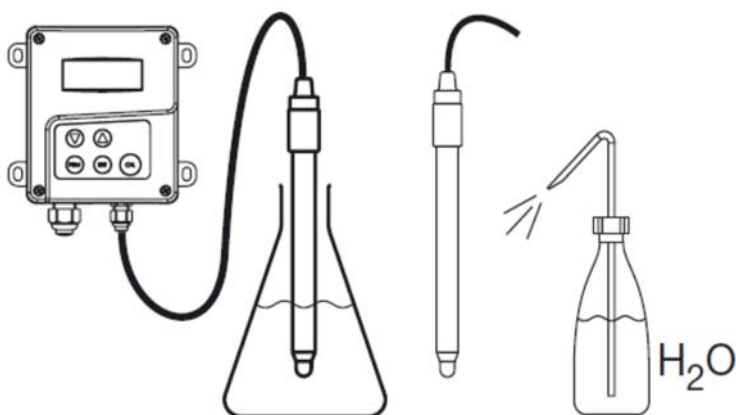
7. Cleaning

The membrane glass must never be exposed to aggressive or abrasive cleaning agents (scouring milk, etc.)!
Cleaning the membrane glass must not result in any scratches!

- Impurities that have accumulated on the surface of the membrane glass and diaphragm must be removed!
- The electrode must be adequately washed off after every cleaning!
- If careful dabbing with a soft moist cleaning tissue proves unsuccessful, various chemical cleaning methods can be used depending on the type of impurity:

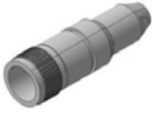| Type of accumulation	Cleaning agent
Lime and metal hydroxide coatings	Diluted hydrochloric acid (1-3%)
Greases and oils	Organic solutions (for example ethanol) or a solution containing a surfactant (dishwashing detergent, etc.)
Protein	Pepsin in diluted hydrochloric acid
Accumulation containing sulfides	Cleaning mixture consisting of hydrochloric acid and thiourea
Inorganic coatings	Hydrochloric acid (0.1 mol/l) or caustic soda (0.1 mol/l)

8. Maintenance

- Under normal conditions (e.g. clean medium, stable, non-extreme pH values) cleaning is recommended every 14 days with monthly calibration.
- Electrodes are naturally consumed by loss of salt from the reference system, etc. A drift in measured values after some time is therefore normal measuring behavior.
- If the measured values drift, the electrode must be cleaned and calibrated!
- Cleaning and calibrating cycles can be adjusted depending on the application and process parameters.
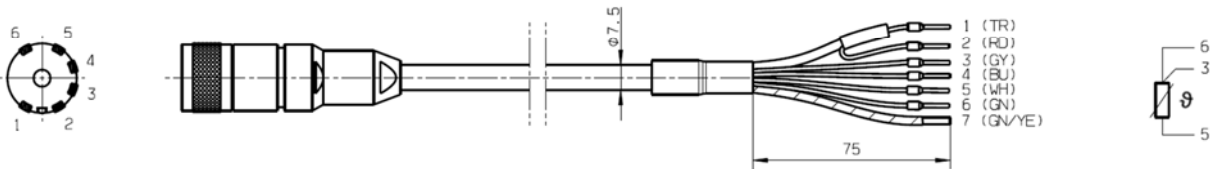
9. Service life and warranty

- All pH and redox electrodes are wear parts. Their operational capability ("service life") depends on care and conditions of usage! Depending on the application, the time until an electrode must be replaced could vary from a few days to several years. Because of this, it is not possible to offer a credible guaranty for a minimum service life.
- If the glass is broken, claims under the warranty are normally not honored.
- If you believe there may be a defect in material or manufacturing, please contact your supplier.

10. Order Codes

Connecting cables for pH and redox electrodes and glass conductivity cells and multisensors with integrated temperature sensor; VP terminal head

Line end 1 (sensor side)	Type of line	Type	Old type	Line end 2 (device side)	
VP (Variopin)- line socket, 6-pin	VP (Variopin) coaxial line with shield +4 stranded wire and cable shield, temperature: -30 to +70, PVC, black			Ferrules	
	Length 5 m:	....	-		
	Length 10 m:	APK-Z1R	-		
			-		

Contact assignment:
(1) pH glas   (2) pH reference   (3) Pt100/1000 (3-wire)   (4) free
(5) Pt100/1000   (6) Pt100/1000   (7) Shield

Order Details Electrode Example: **APS-Z 1 N 1**

Model	Diaphragm	Temperature sensor	Device version
APS-Z	1 = ceramic-diaphragm 2 = PTFE-diaphragm	N = without temperature sensor (N-screwed head conduit Pg 13.5)	1 = general purpose glass 2 = high temperature glass -5…+135 °C

Order Details Connection cable

Model	Cable length	Cable type
APK-Z	5 = 5 m cable length 1 = 10 m cable length	K = Standard coaxial cable R = coaxial cable for electrodes with Pt100 (VP (Vario Pin)-cable socket

Order Details Combined Electrode Example: **ARS-Z 1 G 3**

| Model	Diaphragm	Device version	Electrical connection
ARS-Z	1 = ceramicdDiaphragm 2 = PTFE-diaphragm	G = Gold cap P = Platinum cap	3 = Screw head Pg 13.5

11. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts

- Dispose of the device and packaging in an environmentally friendly manner

- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:

Cd[1]   Hg[2]   Pb[3]   Li[4]
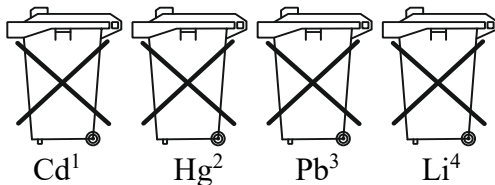
1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment