# APS-1

ASPIRATION PSYCHROMETER ASSMANN

OPERATING INSTRUCTION| DOCUMENT NO. MS-APS-1-OI0001 | 

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# 1. Introduction

The Assmann Psychrometer APS-1 is a precise and reliable instrument designed for measuring air temperature and relative humidity. It is well suited for both professional and educational applications where accurate and repeatable measurements are required.

A key feature of the APS-1 is its backlit thermometers, which allow clear and easy reading even in low-light conditions. In addition, the instrument is lightweight, making it comfortable to hold and operate over extended periods of time without causing fatigue.

The air inlets located at the thermometer tips are equipped with integrated radiation shields. These shields reduce the influence of external radiant heat and help ensure that the thermometers measure the true air temperature rather than being affected by environmental radiation.

Furthermore, the thermometers are laterally protected against direct radiation and mechanical damage. This protective design improves measurement stability and increases the durability of the instrument during field use.

To further enhance measurement accuracy, the thermometers are thermally isolated from the housing and the air inlet tubes. This thermal separation minimizes heat transfer from the instrument itself and prevents distortion of the measured temperature values.

This manual provides an overview of the instrument, explains its operation, and offers guidance on proper use to ensure accurate and dependable measurement results.

The APS-1 may optionally be supplied in a protective hard case, which is strongly recommended for transport and storage. The hard case protects the instrument from mechanical damage, environmental influences, and contamination, particularly during field use.

## Key Features:

- Battery-powered operation using four AAA batteries
- More than 50 measurements can be performed with one set of batteries
- Backlit thermometers for easy reading in low-light environments
- Lightweight design for comfortable handling during extended measurement sessions
- Reliable and accurate measurement of air temperature and relative humidity

# 2. Safety Instructions

Before operating the APS-1 Assmann Psychrometer, please read and follow these safety instructions carefully to ensure safe use and reliable measurement results.

## ⚠ General Safety

The APS-1 is intended for manual, handheld operation only.

Use the instrument exclusively for its intended purpose: measuring air temperature and relative humidity.

Do not open, modify, or disassemble the device. There are no user-serviceable parts inside.

Keep the psychrometer out of reach of children.

**Battery Safety**

- Operate the APS-1 only with four AAA batteries of the specified type.
- Insert batteries with correct polarity as indicated in the battery compartment.
- Do not mix old and new batteries or different battery types.
- Remove batteries if the instrument will not be used for an extended period.
- Replace batteries immediately if leakage is observed.

## Handling and Operation

- Handle the instrument with care and avoid dropping or subjecting it to strong mechanical shock.
- Do not use the APS-1 in explosive atmospheres or near flammable materials.
- Avoid contact with corrosive chemicals or aggressive cleaning agents.
- Ensure sufficient air circulation during measurement to obtain accurate readings.

## Environmental Conditions

- Operate the APS-1 only within the specified operating temperature range stated in the technical specifications.
- Protect the instrument from excessive moisture and direct water exposure.
- Do not store or operate the device in environments with extreme heat or direct sunlight for prolonged periods.

# 3. Warranty

Limited Warranty

The manufacturer warrants that the APS-1 Assmann Psychrometer is free from defects in materials and workmanship under normal use for a period of two (2) years from the date of purchase by the original end user.

If a defect occurs during the warranty period, the product will be repaired or replaced at the manufacturer's discretion, provided the device has been used in accordance with this manual.

## Warranty Conditions

- The warranty applies only to the original purchaser and is non-transferable.
- The warranty does not cover damage caused by misuse, improper handling, battery leakage, accidents, unauthorized modifications, or repairs.
- Normal wear and tear is excluded from the warranty.
- The manufacturer shall not be liable for indirect, incidental, or consequential damages arising from the use or inability to use this product.
- Warranty claims must be submitted with valid proof of purchase (invoice or receipt).

## Warranty Service:

To request warranty service, please contact MeteoSense support at:

support@meteosense.de
www.meteosense.de

Include a description of the issue and the serial number of the device.

# 4. Technical Specifications

| APS-1 Electrical & General Specifications | |
|---|---|
| Dc Input Voltage | 2,5…12 VDC |
| Reverse Polarity Protection | Yes |
| Thermometer range | -35…40°C/-10…60°C |
| Thermometer division | 1/5 |
| Thermometer length | 280 mm |
| Thermometer diameter | 8 mm |
| Thermometer filling | Propylen-Carbonat (blue) |
| Air Speed | 5 m/s |
| Noise level | 45 dB |
| Weight (with Batterie) | 480 g |
| Housing dimension (LxWxH) | 295 mm x65 mm x 50 mm |
| Housing | Anodized Aluminium |

# 5. Initial Operation (First Use)

Unpacking and Inspection

Carefully remove the APS-1 Assmann Psychrometer from its packaging.
Check the instrument for any visible damage that may have occurred during transport.
If damage is detected, do not operate the device and contact the supplier.

**Battery Installation**

1. Turn the instrument so that the rear side is facing up.
2. Slide the battery compartment cover upward. A small slot is provided to assist with opening the cover.
3. Place the supplied pull tabs into the battery compartment so that they lie beneath the batteries. This allows easy battery removal later.
4. Insert four AAA batteries into the battery holder, observing the correct polarity as indicated inside the compartment.
5. Slide the battery compartment cover back into place until it is fully closed.

**Preparing the Wet-Bulb Thermometer**

1. On the right-hand side of the instrument, locate the wet-bulb thermometer.
2. Loosen the knurled screws located above the thermometer.
3. Carefully pull the thermometer straight out of its holder.
    - Ensure that the thermometer is not tilted or forced during removal.
4. Moisten the thermometer wick (sock) using clean water and a suitable container.
    - The wick should be evenly damp but not dripping.
5. Carefully reinsert the thermometer into its holder.
6. Tighten the knurled screws securely, without applying excessive force.

**Readiness for Operation**

After completing the above steps, the APS-1 psychrometer is ready for use.

*Notes: During measurement, ensure that the air inlet opening is kept away from heat sources, direct sunlight, or moist objects, as these may affect measurement accuracy.*

*For stable and reliable readings, it is recommended to suspend the psychrometer using the designated hanging eyelets at the top of the instrument during measurement.*

*Avoid holding the device close to the body and keep it as far as possible from radiant heat sources to prevent measurement errors.*

# 6. Initial Operation (Measurement Start-Up)

After preparing the instrument as described above, the APS-1 Assmann Psychrometer can be put into operation.

**Fan Activation**

- The lower button located at the bottom of the instrument is used to switch on the ventilation fan.
- Press the lower button to start the fan before taking a measurement.

The fan ensures a constant airflow over the thermometer tips, which is essential for accurate psychrometric measurements.

**Stabilization Time**

- After switching on the fan, allow the psychrometer to run for approximately **2 to 3 minutes.**
- This stabilization period allows the wet-bulb thermometer to reach equilibrium through evaporation and ensures reliable temperature readings.

Do not read the values before this stabilization time has elapsed, as this may result in inaccurate measurements.

**Thermometer Backlight**

- To improve readability, especially in low-light conditions, press the upper button to activate the d Thermometer backlight.
- The backlight should be used only when necessary.

*Note: Continuous use of the backlight is not recommended, as it increases battery consumption and may slightly influence the measurement due to additional heat generation.*

**Evaluation of Measurement Results**

- The measured dry-bulb and wet-bulb temperatures must be converted into relative humidity values.
- This conversion can be performed using a psychrometric chart (psychrometric table) or a suitable calculation app (e.g. **CalcComfort**).
- Ensure that the correct air pressure and temperature units are used when performing the calculation to obtain accurate results.

**Measurement Readiness**

Once the fan has been running for the recommended time and the readings have stabilized, the temperature values can be read and used to determine relative humidity.

For best results, ensure the instrument remains suspended or positioned away from the body, heat sources, and direct radiation throughout the measurement process.

# 7. Replacement of the Thermometer Wick

**Replacing the Thermometer Wick (Wet-Bulb Sock)**

To ensure accurate humidity measurements, the thermometer wick must be clean, properly fitted, and replaced when worn or contaminated.

1. Loosen the knurled screw located above the right-hand thermometer.
2. Carefully pull the thermometer straight out of its holder.
    - Make sure not to tilt or force the thermometer during removal.
3. Remove the old wick by cutting the fastening thread with scissors or a knife.
4. Cut a new wick to length, allowing approximately 1 cm extra material.
5. Place the new wick over the thermometer tip.

- Ensure that dirt, dust, or residue is removed from the thermometer before fitting the new wick.

6. Just above the measuring tip, there is a small groove (ridge) on the thermometer.
   - Pull the wick as tightly as possible over this groove.
7. Secure the wick by tying the thread firmly into the groove and knot it securely.
8. Pull the wick downward tightly so that it fits snugly against the thermometer tip.
   - It is essential that the wick lies closely and evenly against the tip with no air gaps, as trapped air will negatively affect measurement accuracy.
9. Tie the wick again as close as possible below the groove and cut off any excess material just below the knot.
10. Carefully reinsert the thermometer into its holder and tighten the knurled screw securely, without excessive force.

**Replacing the Thermometer**

If a thermometer itself needs to be replaced, follow the same removal and insertion procedure described above.
Only use approved replacement thermometers to ensure correct fit and measurement accuracy.

# 8. Maintenance & Calibration

Regular maintenance ensures reliable operation and long service life of the APS-1 Assmann Psychrometer.

- If the instrument will be stored for an extended period, remove all batteries from the battery compartment.
  This prevents damage caused by battery leakage.
- Inspect the thermometer wick regularly and replace it if it becomes contaminated, hardened, or damaged.
- Keep the instrument clean and free from dust and dirt. Clean only with a dry or slightly damp, lint-free cloth.
- Do not use aggressive cleaning agents, solvents, or abrasive materials.

**Calibration**

Accurate measurements depend on properly calibrated thermometers.

- Calibration of the thermometers requires removal from the instrument.
- Thermometers must be sent to a qualified specialist or returned to us for professional calibration.

- Do not attempt to calibrate or adjust the thermometers yourself, as improper handling may lead to inaccurate measurements or damage.

*Note: Regular calibration at appropriate intervals is recommended, depending on usage conditions and required measurement accuracy.*

# 9. Troubleshooting

| Symptom | Possible Cause | Recommended Action |
|---|---|---|
| Device does not switch on | Batteries are empty, inserted incorrectly, or defective | Check battery polarity and condition. Replace all four AAA batteries if necessary. |
| Device does not switch on after battery replacement | Ventilation fan may be blocked | Remove the thermometers and carefully check whether the fan can rotate freely. Remove any obstruction if present. |
| Device does not operate after all checks | Internal fault | Contact technical support or the manufacturer for further assistance. |
| Display backlight starts blinking | Batteries are low | Replace all four AAA batteries. |
| Wet-bulb (right) thermometer shows little or no cooling | Wick is dry or contaminated | Refill with clean water and ensure the wick is properly moistened. Replace the wick if necessary. |

# 10. Accessories / Spare Parts

| Nr. | Part Name | Order Number |
|---|---|---|
| 1 | Thermometer -30…40°C | APS-1-35-40/0,2 |
| 2 | Thermometer -10…60°C | APS-1-10-60/0,2 |
| 3 | Case | APS-1-CA |
| 4 | Accessories | APS-1-AOS |
| 5 | Thermometer Wick Set | APS-1-TWS |
| 6 | Inlet M22x1 | APS-1-IN |
| 7 | Circuit Board and Fan | APS-1-PCBF |

# 11. Disposal and Recycling

The APS-1 contains electronic components. It must not be disposed of with regular household waste.

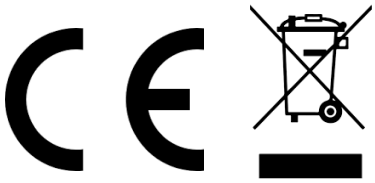
At the end of its service life, the APS-1 must be disposed of in accordance with local laws and environmental regulations for electronic equipment and batteries.

- Please take the device to an authorized collection point for electronic waste.
- The built-in battery must be handled and recycled separately in accordance with local battery recycling standards.
- Do not incinerate or expose the battery to fire or high temperatures.

As a manufacturer, we are registered under the German WEEE system (Stiftung EAR) and comply with all obligations regarding product take-back and recycling.

**WEEE-Reg.-Nr. DE 21710845**

By disposing of the APS-1 correctly, you help protect the environment and support the sustainable reuse of valuable materials.



# 12. Contact & Support

For questions, technical support, or warranty claims regarding the APS-1 please reach out to us:

**MeteoSense**
Support Hotline (Germany): +49 (0) 176 47338802

Email: support@meteosense.de

Website: www.meteosense.de

Support hours:
Mon–Fri, 9:00–17:00 (CET, UTC+1 / UTC+2 during summer time)

What we need from you:
When contacting support, please include the following details to help us assist you faster:
• Serial number of the Sensor
• Description of the issue or error behavior
• A brief summary of any troubleshooting steps you've already tried
• (Optional) Photos or short video showing the problem
We aim to respond to all support queries within 24 hours on business days.