AQS-KAM-xx, AQS 71-KAM-T, AQS-KAM-RH-V
CO2 TEMPERATURE HUMIDITY TRANSMITTERS

PRODUCT DATA & INSTALLATION INSTRUCTIONS

FEATUERS
- Calibration-free technology
- Outstanding long-term stability
- Maintenance free
- universal mounting flange

SPECIFICATION

Power supply 24 Vac, ±20% (SELV)
15…35 Vdc
Power consumption 0.6 W
Max. current consumption 0.35 A (0.3 sec / 15 sec)

Ambient Limits
Operating temperature -20…+60 °C (-4…+140 °F)
Transport and storage -20…+60 °C (-4…+140 °F)
Humidity 0…95% rh, non-condensing

Safety
Protection class III as per EN 60730-1
Protection standard Housing IP65 as per EN60529
Probe IP20
Housing material Flame retardant V0 as per UL94
Housing plastic (PC)
Dimensions see Fig. 1 on page 3
Mounting duct, M16x1,5 cable inlet

CO2 Sensor
Output signal 0…10 V
Output current -1 mA < I L < 1 mA
Output scaling 0…10 V = 0…2000 ppm CO 2
Accuracy (CO2 at 25°C [77°F], 1013 mbar) ± (50 ppm
25°C [77°F], 1013 mbar) +2% of measured value)
Temperature stability: typ. ± (1 + CO2 conc. [ppm] / 1000)
ppm / K (-20 … +45 °C)
Response time τs < 100 sec at 3 m/s
Warm-up time < 5 min

Temperature
Output signal 0…10 V
Output Current -1 mA < I L < 1 mA
Output scaling 0…10 V = 0…50 °C
Accuracy (20 °C [68 °F]) ± 0.3 K
Response time τs < 50 sec. at 3 m/s
AQS-KAM-RH-V τs < 60 sec. at 3 m/s

Table 1. List of devices

<table>
<thead>
<tr>
<th>OS number</th>
<th>CO2 + temp. output</th>
<th>temp. output (passive)</th>
<th>rel. humidity output</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQS-KAM-00</td>
<td>0…10 V</td>
<td>Pi1000</td>
<td>--</td>
</tr>
<tr>
<td>AQS-KAM-01</td>
<td>Ni1000</td>
<td>NTC10kΩ</td>
<td>--</td>
</tr>
<tr>
<td>AQS-KAM-10</td>
<td>NTC20kΩ</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>AQS-KAM-20</td>
<td></td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>AQS 71-KAM-T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AQS-KAM-RH-V</td>
<td></td>
<td></td>
<td>0…10 V</td>
</tr>
</tbody>
</table>

NOTE: Avoid strong mechanical stress and improper handling. The cable gland and housing cover must be screwed tightly against gas penetration, to avoid incorrect measurements.

Table 2. Troubleshooting

<table>
<thead>
<tr>
<th>Error</th>
<th>Possible cause</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrealistic results</td>
<td>Skewed installation</td>
<td>Air inlet and probe tip must be perpendicular to air flow.</td>
</tr>
<tr>
<td>Low air velocity</td>
<td>Air velocity must be &gt; 1 m/sec (200 ft/min).</td>
<td></td>
</tr>
<tr>
<td>Housing not tight</td>
<td>Seal cover and gland tightly.</td>
<td></td>
</tr>
<tr>
<td>Long response time</td>
<td>Contamination of sensor or probe</td>
<td>Check sensor and probe for soiling and clean, as necessary.</td>
</tr>
</tbody>
</table>
Passive Temp. Sensors (AQS-KAM-xx)
Output 2-wire
Wire resistance (typ.) 0.4 Ω (terminal-sensor)

**NTC10kΩ**
Nominal value 10kΩ ±0.5% at 25 °C
Accuracy ±0.2 °C at 25 °C
Response time (typ.) \( t_{63} < 120 \text{ s at 3 m/s air velocity} \)
Sensitivity (typ.) \( -440 \Omega / K \) at 25 °C (non-linear)

**NTC20kΩ**
Nominal value 20kΩ ±0.5% at 25 °C
Accuracy ±0.2 °C at 25 °C
Characteristic NTC20kΩ (see EN0B-0476GE51)
Response time (typ.) \( t_{63} < 120 \text{ s at 3 m/s air velocity} \)
Sensitivity (typ.) \( \approx -934.5 \Omega / K \) at 25 °C (non-linear)

**Ni1000**
Nominal value 1000 \( \Omega \) at 0 °C
Accuracy ±0.4 °C at 0 °C
Characteristic DIN 43760
Sensitivity (typ.) \( \approx 6.18 \Omega / K \)

**Pt1000**
Nominal value 1000 \( \Omega \) at 0 °C
Accuracy (IEC751 Cl. B) \( 0.3 + 0.005 | t | \) at 0 °C
Characteristic see EN0B-0476GE51
Sensitivity (typ.) \( \approx 3.85 \Omega / K \)

Relative humidity (AQS-KAM-RH-V)
Working range 0…95% RH, non-condensing
Output 0…10 V prop. to 0…100% RH
Accuracy at 20 °C typ. ±2% RH, max. ±3% RH in range of 20…80% RH

Note: Temperature / relative humidity / CO₂ accuracy may differ, depending on various environmental conditions (e.g., air velocity or temperature difference between the air temperature and the ambient temperature).

### WIRING

<table>
<thead>
<tr>
<th>Wiring run</th>
<th>Maximum length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor to controller</td>
<td>200 m (660 ft)</td>
</tr>
</tbody>
</table>

Note: Installation of the sensor near high EMI-emitting devices may lead to faulty measurements. Use shielded wiring in areas with high EMI. Keep 15 cm (5.9”) min. distance between sensor lines and 230 Vac power lines. Use two transformers: one for sensors and actuators and one for the controller.

### DIMENSIONS

Fig. 1. Housing dimensions (mm)

### MOUNTING

Screw with torque of 1.5 Nm for break-through. Recommended tightening torque: 3.5 Nm.

Fig. 2. Assembly of conduit / cable gland
Fig. 3. Flange mounting on duct

Fig. 4. Direct mounting on duct (probe length A = 200 mm)
**WIRING**

**NOTE:**
TPASSIVE terminals are active only in AQS-KAM-xx transmitters (not in AQS71-KAM-T)!

Fig. 5. Wiring diagram for AQS-KAM-xx and AQS71-KAM-T (not AQS-KAM-RH-V)

**IMPORTANT**
For failure-free operation and performance according to specifications, it is essential that the supply GND and the measurement GND be wired separately!