HPP270 Series Probes
For hydrogen peroxide, humidity, and temperature measurement

Features
• Basic probe option HPP271 for H\textsubscript{2}O\textsubscript{2} vapor concentration measurement
• Advanced probe option HPP272: compact 3-in-1 probe with real-time measurement of H\textsubscript{2}O\textsubscript{2} vapor concentration, humidity, and temperature
• Superior long-term stability and repeatability with proprietary PEROXCAP™ technology
• CORROSION-RESISTANT stainless steel housing (IP65)
• Traceable calibration certificate
• Standalone probe with digital Modbus RTU over RS-485 or 2 analog outputs
• Compatible with Vaisala Insight PC software and Indigo transmitters

The Vaisala PEROXCAP™ Hydrogen Peroxide, Humidity, and Temperature Probes HPP271 and HPP272 are designed for demanding hydrogen peroxide bio-decontamination where repeatable, stable, and accurate measurement is essential. The HPP270 series probes are suitable for a variety of applications such as isolator, material transfer hatch, and room bio-decontamination.

Up to three measurements in one compact unit
The advanced HPP272 probe option provides all the parameters you need to measure during bio-decontamination processes: hydrogen peroxide vapor, temperature, and humidity as relative saturation and relative humidity.

Repeatable measurement for highly condensing environments
Intelligent measurement technology including the chemical purge function helps to maintain accuracy between calibrations in challenging H\textsubscript{2}O\textsubscript{2} environments. The purging process involves rapid heating of the sensor to remove possible contamination.

The PEROXCAP™ sensor used in the HPP270 series probes is warmed, which prevents condensation from forming on the sensor. This provides reliable measurement even in condensing conditions.

Relative saturation for comprehensive humidity monitoring
Similar to water, H\textsubscript{2}O\textsubscript{2} vapor affects the humidity level of decontaminated air. The advanced HPP272 probe option enables the measurement of relative saturation, which indicates the total humidity level caused by water vapor and H\textsubscript{2}O\textsubscript{2} vapor together. This tells you reliably when the bio-decontaminated air starts to condense.

Indigo and Insight compatible
Vaisala Indigo transmitters provide additional features such as analog and digital outputs, relays, and a smartphone configuration interface. For easy-to-use access to configuration, calibration, and adjustment, the probe can be connected to Vaisala Insight PC software. See www.vaisala.com/indigo and www.vaisala.com/insight.

Traceable calibration at Vaisala
Every probe and sensor is manufactured and individually calibrated at Vaisala world-class facilities.
Available traceable calibration certificates: 2 points for H\textsubscript{2}O\textsubscript{2}, 3 points for humidity, 1 point for temperature.
HPP271 technical data

Measurement performance

Hydrogen peroxide

Sensor
PEROXCAP®

Measurement range
0 … 2000 ppm

Measurement temperature range
+5 … +50 °C (+41 … +122 °F)

Repeatability at +25 °C (+77 °F) up to 500 ppm H₂O₂
±10 ppm

Accuracy at +10 … +25 °C
(+50 … +77 °F), 10 … 2000 ppm H₂O₂ 1)
±10 ppm or 5 % of reading
(whichever is greater)

Factory calibration uncertainty at +25 °C
(+77 °F), 500 ppm H₂O₂ 2)
±10 ppm

Response time (T_{63})
70 s

Other parameters

H₂O ppm by volume
1) Including non-linearity, hysteresis, and repeatability.
2) Defined as ±2 standard deviation limits. See also calibration certificate.

Inputs and outputs

Operating voltage
Digital output: 15 … 30 VDC
Analog output: 15 … 25 VDC

Current consumption at +25 °C (+77 °F)
In digital mode
Max. 10 mA

In analog mode
Max. 50 mA

During purge
Max. 250 mA

Digital output
Interface
RS-485, not isolated; do not use termination on the RS-485 line

Communication protocol
Modbus RTU v1.02

Analog output
Outputs
2 × 4 … 20 mA 3-wire current outputs
Max. load
500 Ω

Accuracy (typical)
±0.1 % of full scale

Analog output temperature dependence
0.005 %/°C (0.003 %/°F) full scale

Operating environment

Operating temperature
+0 … +70 °C (+32 … +158 °F)

Storage temperature
−20 … +70 °C (−4 … +158 °F)

Ambient pressure
Normal atmospheric pressure

EMC compliance
EN/IEC 61326-1, Industrial Environment

Mechanical specifications

IP rating
IP65

Connector
M12/5 male

Materials

Probe body
AISI316L stainless steel

Filter cap
Porous PTFE

Spare parts and accessories

USB cable for PC connection 1) 242659
Probe cable with open wires, 1.5 m (4.9 ft) 254294SP
Probe cable with open wires, 3 m (9.8 ft) 254295SP
Probe cable with open wires, 5 m (16 ft) 254296SP
Probe cable with open wires, 10 m (33 ft) 254297SP

Filter
DRW246363SP

Gland set for through-wall installation, HPP271 HPP271MOUNTINGSET1

Flange for through-wall installation, HPP271 HPP271MOUNTINGSET2

Wall mount for HPP271 and HPP272 HPP272WALLMOUNT

Transmitters

Indigo transmitters
See www.vaisala.com/indigo

## Measurement performance

### Hydrogen peroxide

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<th>PEROXCAP®</th>
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<td>Measurement temperature range</td>
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<td>Repeatability at +25 °C (+77 °F) up to 500 ppm H₂O₂</td>
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<td>Accuracy at +10 ... +25 °C (+50 ... +77 °F), 10 ... 2000 ppm H₂O₂</td>
<td>±10 ppm or 5 % of reading (whichever is greater)</td>
</tr>
<tr>
<td>Factory calibration uncertainty at +25 °C (+77 °F), 500 ppm H₂O₂</td>
<td>±10 ppm</td>
</tr>
<tr>
<td>Response time (T₆₃)</td>
<td>70 s</td>
</tr>
</tbody>
</table>

### Relative saturation

| Measurement range | 0 ... 100 %RS |
| Measurement temperature range | +5 ... +70 °C (+41 ... +158 °F) |
| Repeatability at +25 °C (+77 °F), 500 ppm H₂O₂ | ±0.5 %RS |
| Accuracy at +25 °C (+77 °F) | ±4 %RS |
| Factory calibration uncertainty at +25 °C (+77 °F), 500 ppm H₂O₂ | ±2 %RS |

### Relative humidity

| Measurement range | 0 ... 100 %RH |
| Measurement temperature range | +5 ... +70 °C (+41 ... +158 °F) |
| Accuracy | ±1 %RH |
| Factory calibration uncertainty at +25 °C (+77 °F), 0 ppm H₂O₂, 0 ... 90 %RH | ±1 %RH |
| Response time (T₆₃) | 20 s |

### Temperature

| Sensor | Pt1000 RTD Class F0.1 |
| Accuracy over temperature range | ±0.2 °C (±0.36 °F) |

### Other parameters

- Absolute H₂O₂ and H₂O, H₂O ppm by volume, water vapor saturation pressure (H₂O and H₂O₂+H₂O₂), dew point temperature, vapor pressure (H₂O and H₂O₂).  
  1) Including non-linearity, hysteresis, and repeatability.  
  2) Defined as ±2 standard deviation limits. See also calibration certificate.

## Inputs and outputs

### Operating voltage

| Digital output: 15 ... 30 VDC |
| Analog output: 15 ... 25 VDC |

### Current consumption at +25 °C (+77 °F)

| In digital mode | Max. 10 mA |
| In analog mode | Max. 50 mA |
| During purge | Max. 250 mA |

### Digital output

| Interface | RS-485, not isolated; do not use termination on the RS-485 line |

### Analog output

| Outputs | 2 × 4 ... 20 mA 3-wire current outputs |
| Max. load | 500 Ω |
| Accuracy (typical) | ±0.1 % of full scale |
| Analog output temperature dependence | 0.005 %/˚C (0.003 %/°F) full scale |

## Mechanical specifications

### IP rating

| M12/5 male |

### Connector

| M12/5 male |

### Materials

- **Probe body**: AISI316L stainless steel  
- **Filter cap**: Porous PTFE  
- **Temperature probe**: AISI316L stainless steel  
- **Temperature probe cable**: PTFE

## Operating environment

| Operating temperature | +0 ... +70 °C (+32 ... +158 °F) |
| Storage temperature | −20 ... +70 °C (−4 ... +158 °F) |
| Ambient pressure | Normal atmospheric pressure |
| EMC compliance | EN/IEC 61326-1, Industrial Environment |

## Spare parts and accessories

### USB cable for PC connection

| 242659 |
| Probe cable with open wires, 1.5 m (4.9 ft) |
| 254294SP |
| Probe cable with open wires, 3 m (9.8 ft) |
| 254295SP |
| Probe cable with open wires, 5 m (16 ft) |
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| Probe cable with open wires, 10 m (33 ft) |
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| Filter | DRW246363SP |
| Gland set for through-wall installation, HPP272 | HPP272MOUNTINGSET1 |
| Flange for through-wall installation, HPP272 | HPP272MOUNTINGSET2 |
| Wall mount for HPP271 and HPP272 | HPP272WALLMOUNT |
| Indigo transmitters | See www.vaisala.com/indigo |

HPP271 and HPP272 installation accessories

HPP272MOUNTINGSET1

HPP272WALLMOUNT

HPP272MOUNTINGSET2

HPP271MOUNTINGSET1

HPP271MOUNTINGSET2