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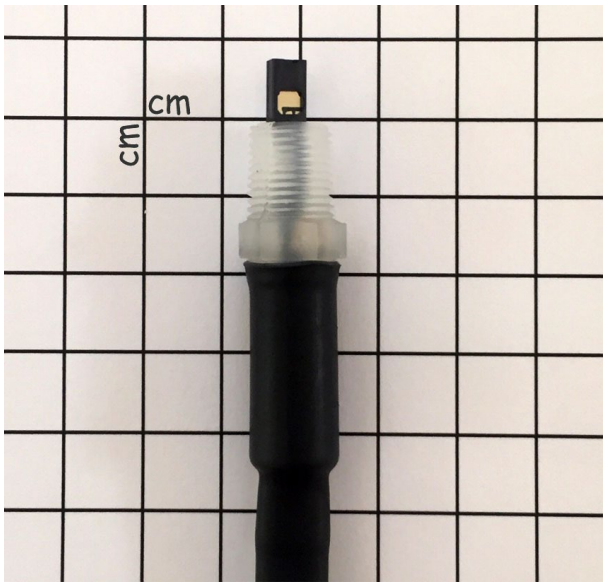
## TSD304 – HUMIDITY TRANSDUCER




The TSD304 Humidity Transducer may be used for ambient humidity measurements or inline gas measurements via a tap compatible with 1/8" NTP threaded connector. The sensor range is 0% to 100% relative humidity with ±3.5% accuracy.

This transducer connects directly to an AMI100D or an HLT100C via a 1.8 m cable.

TSD304 may be used with the Ventilator Validation System VVK100-SYS to convert volumes from ATPD (ambient temperature pressure, dry) to STPD (standard temperature pressure, dry).

### SPECIFICATIONS

| | |
|---|---|
| **Range:** | 0 to 100 % Relative Humidity (RH) |
| **Line Fit:** | Vout = [0.031($Sensor_{RH}$) + 0.80] V, typical at 25 °C<br>*where* V = Volts<br>$Sensor_{RH}$ = (Vout - 0.8 V) / 0.031 |
| **Output Voltage Range:** | 0.5 to 4.5 V |
| **Temperature Compensation:** | True RH = ($Sensor_{RH}$)/(1.0546 – 0.00216T), T in °C |
| **Resolution:** | 0.0080 RH (MP160—no smoothing) |
| **Voltage Range:** | 0.80 V to 3.90 V (typical) |
| **Response Time:** | 5 seconds (nominal time constant) |
| **Accuracy:** | ± 3.5% RH (nominal) |
| **Hysteresis:** | 3% RH (nominal) |
| **Repeatability:** | ± 0.5% RH |
| **Long Term Stability:** | ± 0.5% RH (at 50% RH in one year) |
| **Operating Temperature:** | -40 to +85 °C |
| **Mounting Bulkhead:** | 1/8" NPT Nylon |
| **Interface:** | RJ11 Male Plug (6-pin) to AMI100C or HLT100C |
| **Cable Length:** | 1.8 meters |

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## EXAMPLE SOLUTION FOR LINE FIT

Vout = [0.031 ($Sensor_{RH}$) + 0.8] V @ 25 °C

*Solve for* $Sensor_{RH}$

$$Sensor_{RH} = \frac{Vout - 0.8\ V}{0.031}$$

*Example:* *Assume* Vout = 1 V

*Then ~*

$Sensor_{RH}$ = (1 - 0.8) / 0.031 = 6.45%

## EXAMPLE SOLUTION FOR TEMPERATURE COMPENSATION

Measure temperature (T) using TSD302

$True_{RH} = Sensor_{RH} / (1.0546 – 0.00216 \times T)$, T in °C

*Example*: *Assume* T = 35 °C

$True_{RH}$ = 6.45% / (1.0546 - 0.00216 x 35)

$True_{RH}$ = 6.588%