

Span Pac™ H2O Trace Moisture Gas Standard



The Span Pac™ H2O trace moisture gas standard provides:

- H₂O concentrations adjustable over 20:1 range with single oven; 400:1 with dual oven system; 10,000:1 with secondary dilution mass flow
- Concentrations within 0.01 to 10,000 ppm H₂O range depending on model selection
- H₂O concentrations below 100 ppb with welded model
- Industrial models have NEMA 4 cabinets and optional Z or X purge capability
- Uses KIN-TEK Trace Source™ disposable and user-refillable water permeation tubes

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Trace concentration moisture is an extremely important parameter in gases used in a wide range of processes. But there is no absolute analytical method that can be used in all applications. For most sensing methods, the response to moisture is affected by the background gas and most current methods are subject to “poisoning” by certain contaminants. Basically, all trace moisture sensing systems require calibration to external standards and they must be frequently challenged with standards to demonstrate continued accuracy.

There are three special problems associated with trace moisture calibration:

1. At the lowest concentration levels, there is no real zero reference point for moisture. Standards prepared by simply adding water vapor to a dry gas actually have unknown uncertainty.
2. Water interacts readily with almost all materials, so changes in pressure or temperature can appear as transient concentration changes and may take a very long time to stabilize.
3. Water is pervasive in our atmosphere, so even the most accurate standard may be contaminated in the delivery process.

The Span Pac™ H2O instrument works on a differential principal. Application of this principle is meaningful when the moisture content of the background diluent gas exceeds 10 percent of the minimum concentration to be generated. Calibration is based on the change in analyzer response caused by the addition of a known water vapor concentration from a KIN-TEK Trace Source™ water permeation tube to a flowing stream of the diluent gas. This differential method overcomes the “no zero” problem, and the problem of the background gas affecting the response.

The permeation tube emission rate is certified by the Factory traceable to NIST by gravimetric weight

loss over time. This provides a close approximation to a primary standard, even in situations where primary standards are not available.

KIN-TEK takes special care in design, construction and choice of hardware components to minimize errors due to atmospheric contamination and interactions with other materials in the system.