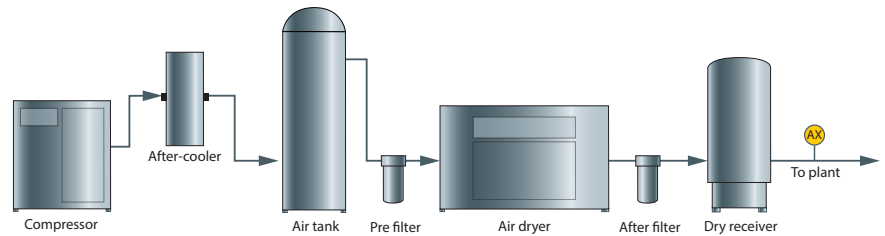


# Petrochem and refining: H<sub>2</sub>O in instrument air



Instrument air system

## Benefits at a glance

- Laser-based measurement selectively detects and measures H<sub>2</sub>O - no false response to other contaminants
- Non-contact laser measurement avoids fouling, corrosion damage, and inaccurate readings
- Fast response to H<sub>2</sub>O concentration changes
- Low maintenance and OPEX costs – no analyzer consumable items

## Instrument air

The air supplied to instruments, transmitters, solenoid valves, and controllers must be clean and dry for efficient operation of system components. Moisture in an instrument air system can cause corrosion and damage instruments and pneumatic controllers. Corrosion damage can cause false readings and/or instrumentation malfunctions potentially leading to process upsets or shutdowns. Refineries and petrochemical plants monitor moisture in instrument air to protect pneumatically controlled devices, and ensure those devices are functioning properly and safely.

## Moisture measurement and control

Moisture, particulate matter, lubricants, and hazardous or corrosive chemicals are the four major types of contaminants defined in ISA-S7.3: Quality Standard for Instrument Air. Continuous monitoring of moisture in instrument air systems helps safeguard instrumentation and pneumatically controlled devices.

## Endress+Hauser's solution

Tunable diode laser absorption spectroscopy (TDLAS) is a SpectraSensors technology proven effective in this important measurement. The laser and detector components in a TDLAS analyzer are isolated and protected from contaminants entrained in instrument air. This design avoids the fouling and corrosion damage problems experienced with analyzers using direct contact sensors (aluminum oxide capacitance sensors and quartz crystal microbalances).

### Application data

Target component (Analyte)	Moisture in air (Instrument air)
Typical measurement range	0-100 ppmv*
Typical repeatability	±1 ppmv*
Measurement response time	1 to ~60 seconds*
Principle of measurement	Non-differential tunable diode laser absorption spectroscopy (TDLAS)
Validation	Certified blend of H <sub>2</sub> O in nitrogen balance

\*Consult factory for alternate ranges.

### Typical background stream composition

Component	Unit	Typical Concentration	Maximum
Water (H <sub>2</sub> O)	ppmv	<10	
Nitrogen (N <sub>2</sub> )	mol%	78	
Carbon dioxide (CO <sub>2</sub> )	mol%	0.03	
Oxygen (O <sub>2</sub> )	mol%	21	
Lubricants	ppmv	0	1

The background stream composition must be specified for proper calibration and measurement performance. Specify the normal composition, along with the minimum and maximum expected values for each component, especially H<sub>2</sub>O, the measured component.