

# Carbon Dioxide Gas

## All Moisture Analyzers

### Application

Moisture is measured in carbon dioxide gas pipelines and processing plants.

### Problem

The presence of moisture in carbon dioxide gas promotes corrosion. Perhaps more significant is the fact that moisture will readily form ice when pressure is reduced. The ice can readily freeze up pressure regulators, valves, and orifice plates causing a loss of flow and even ice expansion damage to process components.

### Equipment

While any of AMETEK's moisture analyzers can be used, the quartz-crystal moisture analyzers must be specified for use in carbon dioxide. The exact choice of model will vary with the purity levels required as well as the desired packaging and options.

### Procedure

Moisture is typically sampled at various locations in a carbon dioxide process line. Acceptable moisture concentrations may vary but are usually between 1 and 100 ppmv. Pressure reduction at the sample tap is typically needed for carbon dioxide pipelines and processes that run at elevated pressures.

Moisture should always be monitored directly downstream of any drying system to provide both a control signal for the drying process and well as a quality assurance measurement for the produced carbon dioxide. In addition, the moisture concentration should be monitored at all custody transfer points, compressor stations, and prior to critical processes to both detect moisture ingress as early as possible and to provide a continuum of QA feedback throughout the process.

### How Previously Handled

No previous attempts were made to continuously monitor moisture in the carbon dioxide pipelines.

### Results

Corrosion was minimized and maintenance costs were reduced with the installation of on-line moisture analyzers. The efficiency of molecular sieve dryers was improved as a result of the implementation of feedback control. In addition, freeze-ups were practically eliminated with the improved QA resulting from the continuum of moisture analysis throughout the system. In the event of excessively high moisture levels, the carbon dioxide gas is re-circulated through molecular sieve dryers to remove the excess moisture before downstream freezing can occur.



455 Corporate Blvd., Newark, DE 19702  
Ph. +1-302-456-4400, Fax +1-302-456-4444  
www.ametekpi.com



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