

## Model 241CE II Hydrocarbon Dew Point Analyzer

### Superior Benefits

- || Accurate and objective direct measurement of hydrocarbon dew point temperature at pipeline pressure or Cricondenthem
- || Proprietary three-stage sample filter provides superior protection
- || Designed for unattended operation with low maintenance
- || Electricity the only consumable
- || Compact design allows mounting in optional enclosures

### The Need

Natural gas producers, distributors, and industrial consumers understand the importance of ensuring that natural gas meets various strict quality specifications which typically include a maximum hydrocarbon dew point temperature. Even relatively small quantities of liquids in natural gas transmission lines can damage sensitive metering equipment, plug lines, interfere with odorants, and most importantly, create unsafe conditions. Liquid drop out is not only an operational and safety concern, but may also result in errors in other critical measurement equipment. Hydrocarbon liquids in natural gas delivered to end-users can cause damage to gas turbines, upset plants using natural gas as chemical feedstock, increase emissions from burners, and compromise safety.

In many applications, automated on-line analyzers, such as the Western Research 241CE II Hydrocarbon Dew Point Analyzer, are replacing manual chilled mirror devices or calculation methods, which have traditionally been used to determine hydrocarbon dew point temperature. For over 15 years, AMETEK Western Research has provided an accurate and low-

maintenance analyzer for automated direct measurement of hydrocarbon dew point temperature in natural gas streams, using a patented chilled mirror design.

### Direct Measurement

The Model 241CE II Analyzer uses a thermoelectric cooler to control the temperature of a two-surface mirror. During each measuring cycle, the microcontroller cools the mirror at a controlled rate until the optics have detected changes in light intensity that occur when liquids condense on the two surfaces of the mirror. Differences in surface tensions between liquid hydrocarbons and other condensables enable the analyzer to reject non-hydrocarbon dew points. This ability along with sensitive optics and a precisely controlled cooling rate provides improved accuracy and repeatability compared to a manual chilled mirror type device which depends on the training of the operator. The temperature of the mirror in the 241CE II is measured using a Platinum RTD which provides higher accuracy and long term stability compared to thermocouples.

The Model 241CE II is designed for unattended operation, in a complete package, without the need for

additional remote controllers, or costly sample systems. It carries CSA and ATEX certification for use in hazardous areas using an EEx d (flameproof) type enclosure. Sample gas flows through a measuring cell mounted on the outside of the flameproof electronics enclosure which simplifies sample system maintenance.

A fully integrated sample system package, including proprietary multiple stage filtration specifically designed for natural gas samples, protects the analyzer from common natural gas contaminants (aerosols, particulates and liquid slugs) and ensures reliable, fast, and accurate means of detecting the hydrocarbon dew point temperature in natural gas applications.



Model 241CE II Hydrocarbon Dew Point Analyzer - European version shown on backpan. Analyzer must be installed in an environmentally controlled building or shelter.

# Model 241CE II Hydrocarbon Dew Point Analyzer

## Performance Specifications

**Methodology:** Chilled-mirror

**Accuracy:** Hydrocarbon dew point temperature  $\pm 1^{\circ}\text{C}$  ( $\pm 2^{\circ}\text{F}$ )

**Sensitivity:** Temperature  $\pm 0.1^{\circ}\text{C}$  ( $\pm 0.2^{\circ}\text{F}$ )

**Sample Transport:** 1/4 inch stainless steel instrument tubing recommended (heat tracing may be required)

**Typical Flow:** 1 to 5L/min. (2 to 10 scfh) depending on sample system configuration and pressure

**Ambient Temperature:**  $10^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  ( $50^{\circ}$  to  $104^{\circ}\text{F}$ )

**Cooling Capability:** Typically  $60^{\circ}\text{C}$  ( $108^{\circ}\text{F}$ ) below the temperature at the analyzer installation. The cooling capability of the analyzer is affected by the ambient temperature, sample gas composition and the pressure. (Consult your AMETEK representative for evaluation of your application.)

**Highest Measurable Dewpoint:** Application dependent, typically  $15^{\circ}\text{C}$  ( $27^{\circ}\text{F}$ ) below the temperature at the analyzer installation

**Maximum Working Pressure:** 13.79 MPa (2000 psi)

**Power:** 120 VAC  $\pm 10\%$ , 60 Hz or 240  $\pm 10\%$  VAC, 50 Hz

**Power Consumption:** less than 275 W

**Outputs:** 4-to-20 mA (isolated, loop-power by customer or optional self-powered)

**Physical Dimensions (H x W x D):** 838 x 571.5 x 289 mm (33 x 22.5 x 11.37 in.)

**Weight:** 60 kg (132 lbs.)

**Approvals and Certifications:** Class I, Division 1, Groups C & D ATEX II 2 G EExdIIBT4 Russian Ex Proof Certification; 1Exd IIB T3 X CE Compliance: Complies with all relevant European Directives

## Applications

- ▀ Pipeline quality and custody transfer
- ▀ Monitor inlet and outlet of storage facilities
- ▀ Control of contractual blending operations
- ▀ Monitor amount of superheat in gas turbine feed gas
- ▀ Optimizing of switch times for pressure swing adsorption

## Standard Features

### Outputs

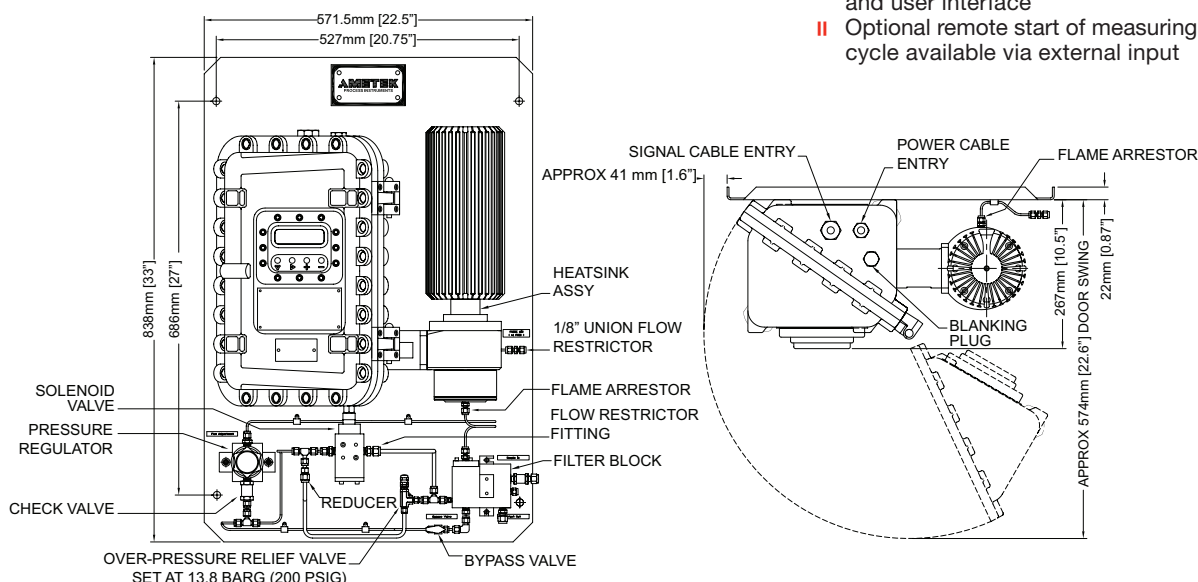
- ▀ Hydrocarbon dew point temperature current output
- ▀ Digital communications via Modbus RTU protocol

### Sample System

- ▀ Fully integrated sample system, including three-stage natural gas filter block and flow control
- ▀ Optional regulator for measurement at Cricondentherm

### User Interface

- ▀ On-board microcontroller, display, and user interface
- ▀ Optional remote start of measuring cycle available via external input



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