1221 Distillation Sample Probe

GENERAL DESCRIPTION:

The Universal Analyzers Model 1221 Distillation Sample Probe is a unique self-cleaning and temperature stabilized primary sample conditioning system for demanding on-line gas analysis applications.

It is designed to solve the key issues that compromise plant performance by improving measurement accuracy and reliability. The 316SS self-cleaning separator is designed to condense and wash heavy components in the sample back into the process along with any deposited solids avoiding the regular 'plugging' that occurs with conventional conditioning systems. Maintenance of the probe is further simplified, as once isolated from the main-line, the separator can be removed without the need to remove the entire probe.

The sample probe uses a multiple-stage cooling design which is made entirely of 316SS. This provides efficient removal of entrained liquids due to its high surface area and thermal efficiency resulting from the unique cooling transfer design utilizing proprietary TraceBoost™ technology.

The high-performance probe design is ideal for use in applications such as ethylene furnaces, FCCUs and coke ovens. The dual vortex cooling system (feed-forward and feed-back control with the electronic control); ensures high-accuracy analyzer performance and protection against liquid carry-over, minimizing the effects of changes in ambient or process temperature. The unique vortex cooling design simultaneously cools the sample and removes particulates, water, and high boiling-point compounds. The electronic controller includes self-diagnostics with local and remote monitoring and displays, configurable fail-safe alarms, and DCS integration, eliminating the need for regular scheduled inspections.

Applications:

- Decoke Operations
- Fluidized Catalytic Cracking Units (FCCU)
- Ethylene Cracking Furnaces
- Syngas

Typical Installations:

- Decoke headers
- Hot, wet or dirty process gases
- Pyrolysis gases
- Heavy particulate removal
- Fine carbon removal

FEATURES:

- Accurate temperature outlet gas temperature control (± 1°F) with the optional electronic controllers
- Single and dual pneumatic controllers available
- Prevents liquid carryover
- Remote monitoring
- Self-cleaning separator
- Reduced maintenance
- Removable one piece 316SS separator
- Automatic sampler shut-down on high inlet temperature or high outlet temperature with optional electronic controllers
- High "R" factor cooling chamber
- Probe can be sized to supply 1-5 LPM of sample
- Suitable for hazardous areas

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1221 Distillation Sample Probe

Specifications

- Process contacting parts: 316 SS
- Inlet flanged available in: 2”, 2.5” or 3”-150#. Optional 300# flange available
- Probe weight: 150 lbs (68 kg)
- Shipping weight with crate: 150 lbs (68 kg)
- Min process temperature: 100°F (38°C)
- Max process temperature: 1,000°F (538°C) with 150# flange and 1,500°F (815°C) with 300# flange
- Max process pressure with 150# flange: 20 psi (1.36 bar) @ 1,000°F (538°C)
- Max process pressure with 300# flange: 40 psi (2.72 bar) @ 800°F (426°C)
- Ambient temperature: 32° to 158°F (0-70°C) with pnuematic controller
- On-board electronic controllers must be kept below 54°C (130°F)
- Sample outlet: 1/4” tube or 3/8” tube
- Suitable for: Class I, Div. 2, A, B, C, D
- Inlet, outlet, and coolant temperature monitoring with the electronic controllers
- All data available from the electronic controllers via Modbus RTU and TCP/IP
- Probe sample gas flow rate: 1-5LPM (possibly higher with some applications)
- Internal dead volume: 1,000cc
- Exit gas temperature: Controlled ± 1°F (0.5°C) with electronic controllers (± 5°F with pneumatic)

Supply Requirements

- Electrical 110/230 V AC 50/60 Hz with electronic controller *(May be wired with 24 VDC - contact factory for instruction)*
- Power consumption (1.3A @ 110VAC/.8A @ 230VAC)
- Air (Maximum) 40 CFM @ 80-100psi (80CFM for dual vortex options)

		Air Consumption 40 SCFM Vortex Tube in SCFH Duty Cycle % Time on					Air Consumption 15 SCFM Vortex Tube in SCFH Duty Cycle % Time on	
		20%	40%	60%	80%	100%	80%	100%
Pressure (psi)	80	384 SCFH	768 SCFH	1152 SCFH	1536 SCFH	1920 SCFH	576 SCFH	720 SCFH
	90	432 SCFH	864 SCFH	1296 SCFH	1728 SCFH	2160 SCFH	648 SCFH	810 SCFH
	100	480 SCFH	960 SCFH	1440 SCFH	1920 SCFH	2400 SCFH	720 SCFH	900 SCFH

** 15 SCFM @ 100% Duty Cycle is equvialent to 40% SCFM cycle with 40% Duty Cycle.*
*** Maximum sample flow is reduced if 15 SCFM Vortex Tube is used.*

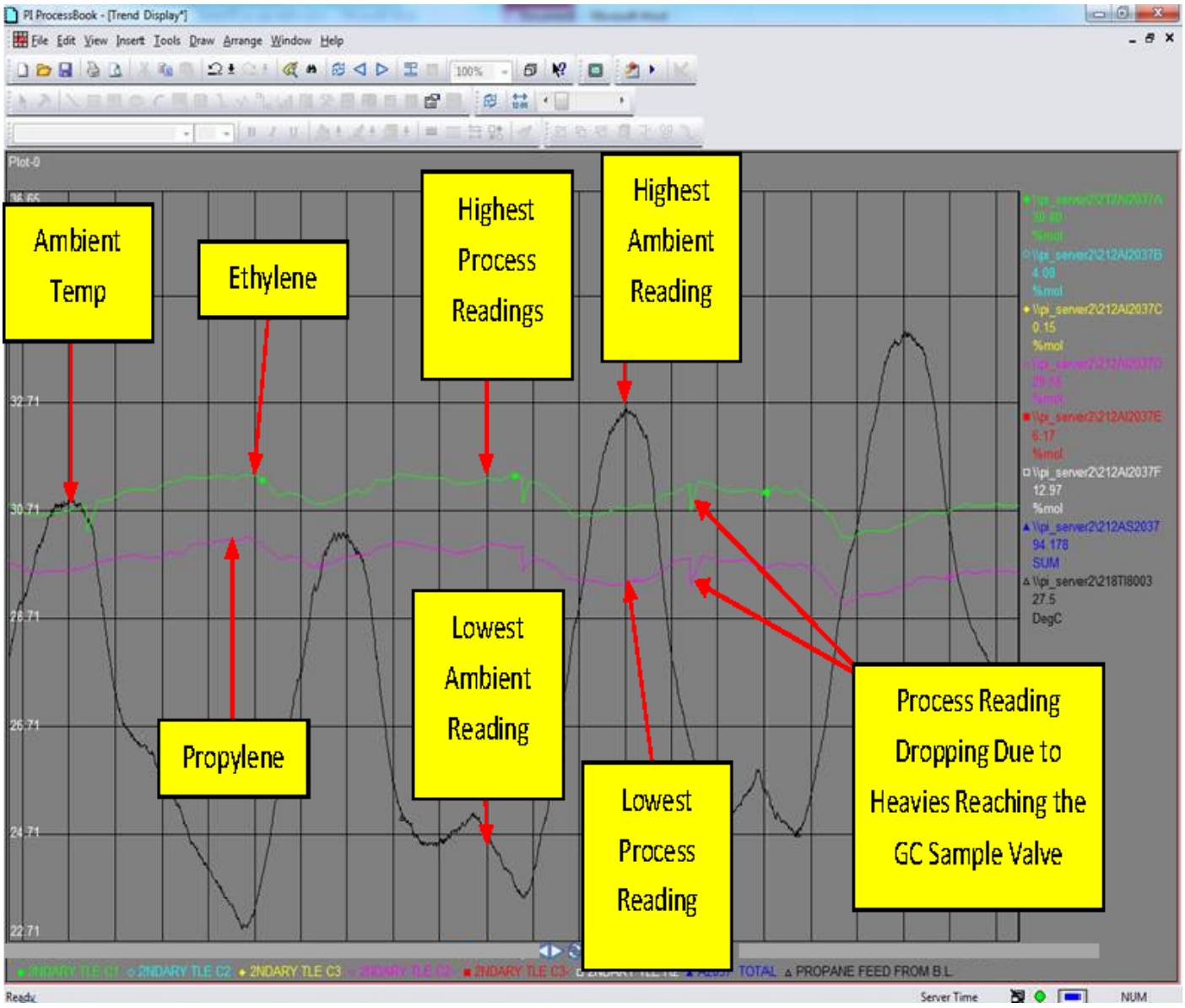

FIGURE 1 – RESULTS FROM COMPETITORS DISTILLATION SAMPLER SHOWING THE AFFECT AMBIENT TEMPERATURE HAS ON ANALYSIS OVER A PERIOD OF 4 DAYS (REFERENCE DATA FROM MARCH 2014) (MIN AMBIENT 61F (16C) – MAX AMBIENT 91F (32C)

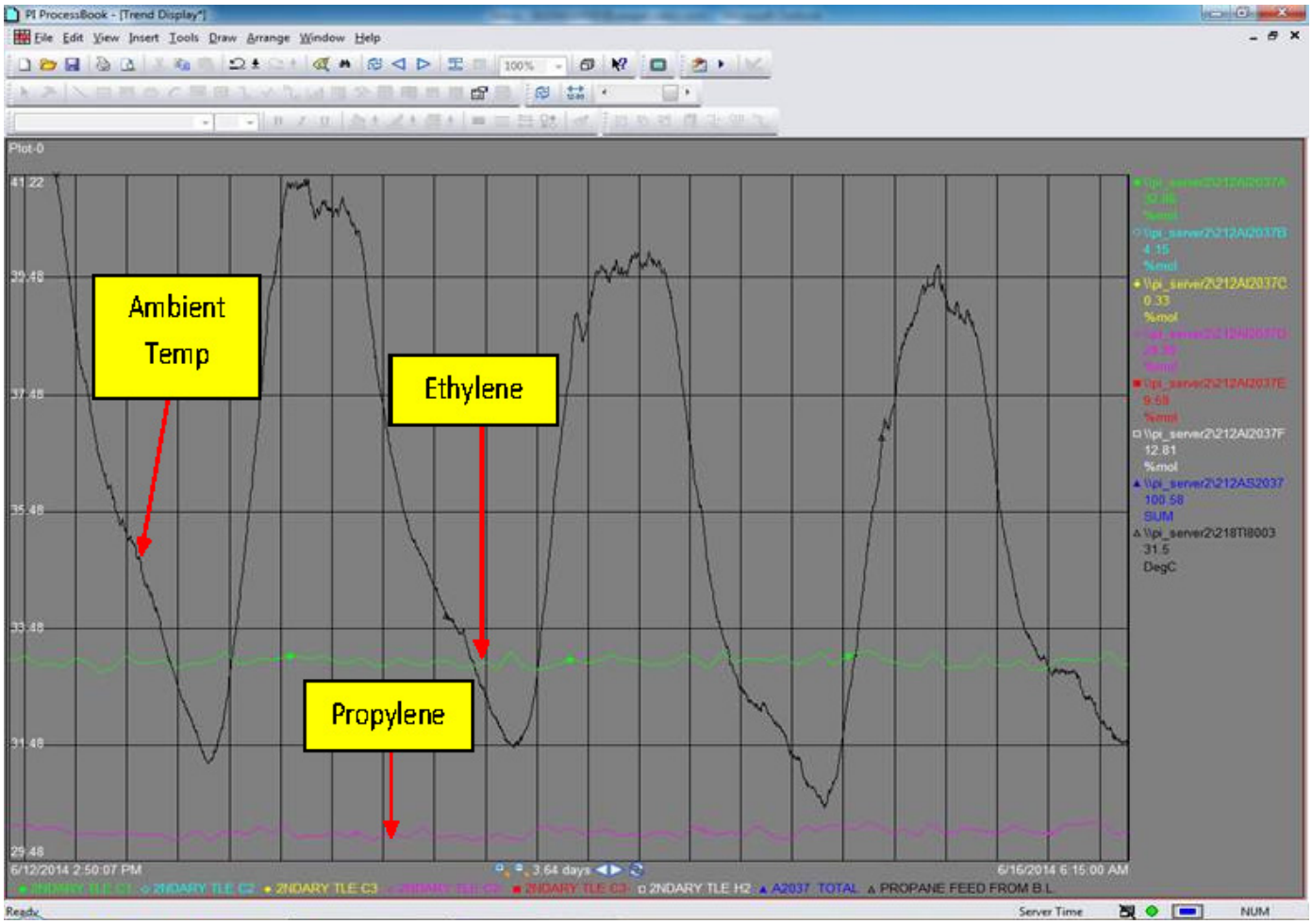

FIGURE 2 – RESULTS FROM UNIVERSAL ANALYZERS MODEL 1221 DISTILLATION SAMPLE PROBE SHOWING NO AMBIENT TEMPERATURE AFFECT ON ANALYSIS OVER A PERIOD OF 4 DAYS (RFERENCE DATA FROM JUNE 2014) (MIMIMUM AMBIENT 80F (26C) – MAXIMUM AMBIENT 110F (43C)