SAMPLE SYSTEM SPECIALISTS FOR GAS ANALYSIS

- Gas Sample Probes
- Sample Transport Bundles
- Gas Coolers
- Sample Conditioning Systems
- PLC Controls
Model 270S – Extractive Gas Sample Probe

The Universal Analyzers Model 270S heated extractive gas sample probe is the basic configuration. It has an IP55/NEMA 3 weatherproof enclosure and the heated filter is thermostatically controlled to 70°C (340°F). No tools are required to replace the filter. Many options can be added to the basic unit to configure the 270S for almost any application.

Features include:
- Corrosion resistant stainless steel flow path with optional PTFE or SilcoNert™2000 coating. Hastelloy C276 flow path components are also available.
- Sample out and calibration gas inlet connections
- 1/2” MNPT process connection
- Integrated filter temperature switch and low temperature alarm contacts
- Optional mating flanges, blow back and probe tubes
- Optional ATEX, CSA and FM hazardous area certifications

Model 270SF – Extractive Gas Sample Probe

The Universal Analyzers Model 270SF heated extractive gas sample probe is our most popular configuration. It includes the easy change filter design and is most commonly housed in a weatherproof IP66 fiberglass enclosure. The blowback accumulator tank and ANSI mounting flange are other popular options.

Features include:
- Corrosion resistant stainless steel flow path with optional PTFE or SilcoNert™2000 coating. Hastelloy C276 flow path components are also available.
- Sample out and calibration gas inlet connections
- Integrated filter temperature switch and low temperature alarm contacts
- ANSI/DN mounting flanges for stack or duct connection
- Optional ATEX, CSA and FM hazardous area certifications

Model 270SF/NH₃ – Extractive Gas Sample Probe with Ammonia Convertor

The Universal Analyzers Model 270SF/NH₃ heated extractive gas sample probe with ammonia convertor provides two sample stream outlets; one non-converted and the other is after an NH₃ to NO conversion. This configuration is primarily used when measuring NH₃ downstream of an SCR (Selective Catalytic Reduction) unit using the NOₓ differential methodology.

Features include:
- Heated filter chamber to 290°C (550°F ) with high temperature O-rings and seals
- Dual sample outlet and calibration gas inlet connections
- Blow back with high pressure accumulator tank and solenoid valve
- Integrated filter temperature switch and low temperature alarm contacts
- Temperature sensor for remote control of convertor oven
- Integrated NH₃ convertor with heated transition between filter and convertor oven.
- ANSI/DN mounting flanges for stack or duct connection
Model 271 – Extractive Gas Sample Probe

The Universal Analyzers Model 271 non-heated extractive gas sample probe is used in applications that contain a high amount of dust but have low moisture content and additional heat is not required for the probe. This configuration includes an oversized probe tip filter, an impact shield and a high pressure high volume blowback assembly.

Features include:
• Large surface area probe tip filter
• Aggressive high pressure high volume blowback assembly with dual accumulator tanks
• Quick release probe tube and filter assembly
• Weatherproof IP66 enclosure with optional heater
• ANSI/DN mounting flanges for stack or duct connection

Model 275E – Extractive Gas Sample Probe

The Universal Analyzers Model 275E heated extractive gas sample probe is used in moderate to high dust applications downstream of a combustion source. It has an IP66/NEMA 4X stainless steel weatherproof enclosure, a 190°C (375°F) heated filter assembly with integrated control and a high volume, high pressure, blowback assembly.

Features include:
• Heated oversize woven stainless steel filter element
• Aggressive high pressure high volume blowback assembly with dual accumulator tanks
• Isolation valve protects downstream components from over pressure during blow back
• Stainless steel IP66/NEMA 4X weather proof enclosure with optional heater
• ANSI/DN mounting flanges for stack or duct connection

Model 275HD – Dilution Gas Sample Probe

The Universal Analyzers Model 275HD heated extractive dilution gas sample probe is for applications requiring dilution of a sample gas stream. Primary installations include continuous emissions monitoring at coal fired power plants and refineries.

Features include:
• Out of stack critical orifice and eductor
• Dilution ratios from 10:1 to 1000:1
• Fast loop bypass for increased response time
• Heated oversize woven stainless steel filter element
• Optional high pressure high volume blowback assembly with dual air accumulator tanks
• Optional Integrated zirconium oxide wet oxygen sensor
• Stainless steel IP66/NEMA 4X weather proof enclosure
• ANSI/DN mounting flanges for stack or duct connection

Sample Transport Bundle

O’Brien TRACEPAK® STACKPAK™ bundles combine heated sample tubes with calibration gas and blowback lines while maintaining a consistent temperature throughout. The necessary wiring for power to the probe heater, calibration gas and blowback switching is included in the bundle along with SensorTube™ for temperature monitoring and control. Order with the probe for a complete system.

Features include:
• Reliable temperature maintenance of sample during transport
• All required systems incorporated in one bundle
• Heated and unheated tubes for sample, blowback and calibration gas
• Simplified installation and temperature control
500 Series – Thermoelectric Gas Cooler

The Universal Analyzers 500 Series thermoelectric gas coolers are designed to lower the dew point and condense water from a gas sample stream with minimal loss to water soluble compounds. The 500 series uses 5” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack, process and auto emission gas analyzer samples.

Features include:
• Unique heat exchanger design can be disassembled for cleaning and inspection
• Self-regulating with a very stable outlet dew point
• Passive-Active and Active-Active configurations
• Flow rates from 2.5 l/m to 5 l/m
• Digital temperature display with LED status lights and temperature alarm contacts
• On-board electronics for water carryover sensor

600 Series – Mini Thermoelectric Cooler

The Universal Analyzers 600 Series thermoelectric gas coolers are an excellent choice for OEM applications. They reliably lower the dew point and condense water from a wet gas sample stream with minimal loss to water soluble compounds. The 600 series uses 5” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack, process and auto emission gas analyzer samples.

Features include:
• Compact and light weight
• Self-regulating with a very stable outlet dew point
• Passive-Active and Active-Active configurations
• Flow rates from 2.5 l/m to 5 l/m
• Digital temperature display with LED status lights and temperature alarm contacts
• Requires external power supply

1000 Series – Thermoelectric Gas Cooler

The Universal Analyzers 1000 Series thermoelectric gas coolers are designed to lower the dew point and condense water from a wet gas sample stream with minimal loss to water soluble compounds. The 1000 series use 10” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack, process and auto emission gas analyzer samples.

Features include:
• Unique heat exchanger design can be disassembled for cleaning and inspection
• Self-regulating with a very stable outlet dew point
• Passive-Active and Active-Active configurations
• Flow rates from 2.5 l/m to 15 l/m
• Digital temperature display with LED status lights and temperature alarm contacts
• On-board electronics for water carryover sensor
1100 Series – Vortex Gas Cooler

The Universal Analyzers 1100 Series vortex gas coolers are designed to lower the dew point and condense water from a wet gas sample stream with minimal loss to water soluble compounds. The 1100 series uses 10” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack, process and auto emission gas analyzer samples.

Features include:
- Unique heat exchanger design can be disassembled for cleaning and inspection
- Vortex tube cooled with compressed air — no electronics
- Oversized heat sink for maximum cooling efficiency
- Flow rates from 4 l/m to 10 l/m
- Ideally suited for explosive and hazardous classified areas

3000 Series – Thermoelectric Gas Cooler

The Universal Analyzers 3000 Series thermoelectric gas coolers are designed to lower the dew point and condense water from a wet gas sample stream with minimal loss to water soluble compounds. The 3000 series uses 10” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack, process and auto emission gas analyzer samples.

Features include:
- Self-regulating with a very stable outlet dew point
- Passive-Active and Active-Active configurations
- Flow rates from 2.5 l/m to 8 l/m
- Digital temperature display with LED status lights and temperature alarm contacts
- Optional ATEX, CSA and FM hazardous area certifications

5000 Series – Compressor Cooler

The Universal Analyzers 5000 Series compressor type gas coolers are designed to lower the dew point and condense water from a wet gas sample stream with minimal loss to water soluble compounds. The 5000 series uses 5” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements. Primary applications include continuous drying of combustion stack and auto emission gas analyzer samples.

Features include:
- High performance compressor motor proves a very stable dew point at the outlet
- Efficient in ambient temperatures up to 50°C (120°F)
- Flow rates from 2.5 l/m to 7 l/m
- Digital temperature display with LED status lights and temperature alarm contacts
- Optional sample pumps and filters with water carryover sensors are integrally mounted on enclosure

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SCD – Sample Conditioning Drawer

The Universal Analyzers Model SCD sample conditioning drawer is a complete 19” rack mount gas sample conditioning system. Primary applications include continuous use in combustion stack gas, process gas and auto emissions gas analysis systems. The SCD incorporates a thermoelectric gas cooler with 5” heat exchangers. It provides a self-regulated 4°C outlet dew point. The layout of the SCD is designed to allow easy access for service especially to consumable components such as the sample pump diaphragm, sample filter and peristaltic pump tubing.

Features include:

- Standard size rack mounting
- Compact design for applications with limited space
- Single or dual gas streams with five gas analyzer channels and up to six calibration gases
- Designed for your specific application and specifications including:
  - Coolers
  - Filters
  - Flow Meters
  - Pressure Gauges
  - Temperature Controllers
  - Peristaltic Pumps
  - Water Carryover Sensors
  - Stream Switching Solenoids
  - Regulators
  - Integrated PLC

SCP/SCU – Sample Conditioning Plate

The Universal Analyzers Model SCP and SCU sample conditioning systems are complete gas sample conditioning systems assembled on a back plate for wall mounting or a 19” U-bracket. Primary applications include continuous use in combustion, stack gas, process gas and auto emissions gas analysis systems. The layouts of the SCP and SCU panels are designed to allow easy access to the user serviceable and consumable components such as the pump diaphragm, filters and peristaltic pump tubing.

Features include:

- Choice of wall panel or 19” U-bracket mounting
- Designed for your specific application and specifications including:
  - Coolers
  - Filters
  - Flow Meters
  - Pressure Gauges
  - Temperature Controllers
  - Peristaltic Pumps
  - Water Carryover Sensors
  - Stream Switching Solenoids
  - Regulators
  - Integrated PLC
- Optional PLC provides automated functions including analyzer validation/calibration plus probe blow back control

1095E Series – Acid Aerosol Chiller System

The Universal Analyzers Model 1095E freezer chiller is a panel mounted gas conditioning system that delivers a very low dew point in demanding conditions. It minimizes the formation of acidic aerosols in the gas sample stream. The 1095E utilizes four heat exchangers and a two-stage temperature reduction method to provide a -25°C (-13°F) outlet dew point. It incorporates the Universal Analyzer unique heat exchanger design that can be disassembled for cleaning and inspection without tools. Primary applications include continuous drying of samples in combustion, stack gas and process gas analysis systems containing high amounts of SO₂ and SO₃.

Features Include:

- Convenient 21” x 27” wall mount panel
- Heated sample pump, peristaltic pump, water carryover sensor, sacrificial coalescing filter and flow meter
- Provides a -25°C (-13°F) outlet dew point at a full 5 l/m flow rate
- Digital temperature display with LED status lights and temperature alarm contacts
512 / 513 / 514 – Portable Sample Systems
The Universal Analyzers Models 512, 513 and 514 are portable gas sample conditioning systems in a hand carrying case. They are intended for temporary use in gas analysis systems by stack testers, laboratories or as an emergency CEMS backup. They use 5” heat exchangers to provide a self-regulated 4°C outlet dew point for low to moderate flow rate requirements.
Features include:
• Mounted in a compact stainless steel hand carrying case
• Includes a gas cooler, pump, water carryover sensor and flow meter
• Passive-Active and Active-Active configurations available
• Flow rates from 2.5 l/m to 5 l/m
• Digital temperature display with LED status lights and temperature alarm contacts

3100 Series – Transportable Sample System
The Universal Analyzers 3100 Series is a gas sample conditioning system in a portable enclosure. They are designed for discontinuous use in any gas analysis system. The 3100 Series use 10” heat exchangers to provide a self-regulated 4°C outlet dew point for moderate to high flow rate requirements. Typical applications include stack testers, laboratories or as a temporary backup for a CEMS.
Features include:
• Components mounted in a compact enclosure with viewing window and handles
• Components include gas cooler, pumps, water carryover sensor and flow meter
• Supports one or two gas sample streams
• Passive-Active and Active-Active configurations available
• Flow rate from 2.5 l/m to 5 l/m
• Digital temperature display with temperature alarm contact

Model 728 – Dilution Probe Control Drawer
The Universal Analyzers Model 728 dilution probe controller is designed to maintain air pressure and calibration gases to the dilution probe and downstream gas analysis system. It is in a standard 19” rack mount enclosure with both typical and end user specified components.
Features include:
• Precision pressure regulator for dilution air control
• Pressure gauge for dilution air inlet pressure display
• Vacuum gauge to monitor eductor efficiency
• Flow meters for sample and calibration gas control
• Calibration gas solenoid valves with manual and remote control
• Customizable to meet customer specific requirements
• Designed for use with the Model 275HD Dilution Probe or other manufactured dilution probes
Universal Analyzers Inc. offers a wide array of accessories for your sample systems and gas coolers. Although integrated into all of our complete units, these accessories are also available for purchase individually as either a back up or upgrade to an existing system.

**Heat Exchangers**
Universal Analyzers heat exchangers (impingers) are an integral component in all Universal Analyzers gas sample coolers and chillers. Our unique design minimizes the contact time between the gases being measured and the condensate formed. This design results in minimal loss to water soluble compounds. The Universal Analyzer heat exchangers are easily disassembled for inspection and cleaning. They are available in stainless steel, glass / Kynar, Hastelloy, Kynar or with special coatings.

**Condensate Drains**
Universal Analyzers condensate drains include peristaltic drain pumps, automatic liquid drains and eductors. Our positive displacement peristaltic pumps are used in most gas analysis systems. The pump is configured to continuously drain condensate from our gas coolers and chillers. The tubing provided is selected for maximum chemical resistance. In applications where the sample stream is under pressure, a peristaltic pump may not be required and an automatic liquid drain is provided.

**Probe Tubes**
Universal Analyzers offers probe tubes in a wide variety of lengths and materials. Temperature, flow velocity and gas stream components determine which material will best fit your application. stainless steel, Hastelloy, Inconel and ceramic are common probe tube materials.

Special supported probe tubes can be provided for high velocities such as downstream of a simple cycle turbine.

We also provide probe tip filters for high dust applications and heated probe tubes for applications where dew point presents a corrosion problem at the transition from the point of measurement to the heated sample probe.

**Pumps**
Universal Analyzers supplies a variety of low maintenance gas sample pumps as stand-alone components and as an integral part of our gas conditioning systems. Our diaphragm pumps are 100% oil free, leak free and contamination free. They are ideally suited for stack gas and process gas analyzer systems. Universal Analyzer sample pumps are primarily used to transport gas sample streams from the point of measurement to the gas conditioning system and analyzer rack. Heated and non-heated single and dual head configurations are available as well as general purpose or hazardous area models.

**Coalescing Filters and Water Carryover Sensors**
Universal Analyzers offers additional components that can be used with any sample conditioning system to insure that a clean, dry sample is delivered to the analyzer panel. We provide two models of water carryover sensors that detect the presence of condensate downstream of a gas cooler. The Model WCOF combines a coalescing filter and water carryover sensor in a single unit with a chemical resistant housing. The Model WCO is a standalone sensor only. Both include a chemical resistant housing; and provide a warning if condensate forms downstream of the gas cooler.

The carryover sensor can protect downstream instrumentation when they are used with an alarm and or a shutoff relay to the sample pump. For applications where aerosols may be present we recommend our membrane or sacrificial coalescing filter.