

# Wahl's **NEW!** U-Line Series Combustion Flue Gas Analyzers

*For Residential HVAC use in systems below 239,000 BTU's (70kW)*



U-Line 1000

## U-Line 1000 Basic Analyzer up to 2 Sensors!

O <sub>2</sub>	Efficiency
CO <sub>2</sub>	Excess Air
CO	Differential Pressure
	T air T gas



U-Line 2000

## U-Line 2000 7 Instruments in 1! Professional Analyzer up to 3 Sensors!

O <sub>2</sub>	Excess Air
CO <sub>2</sub>	Differential Pressure
CO	T air T gas ΔT
NO <sub>x</sub>	T air T gas
CO/CO <sub>2</sub> ratio	Ambient CO Monitor
Efficiency	Gas Leak Detector



U-Line 3000

## U-Line 3000 8 Instruments in 1! Advanced Analyzer up to 4 Sensors!

O <sub>2</sub>	Efficiency
CO <sub>2</sub>	Excess Air
CO	Differential Pressure
NO <sub>x</sub>	T air T gas
SO <sub>2</sub>	Ambient CO Monitor
CO/CO <sub>2</sub> ratio	Gas Leak Detector

**Wahl's NEW U-Line Series** provides the latest technology in combustion flue gas analysis. Easily replaceable gas sensors are long life and low maintenance. Set audible buzzer alarms for selectable levels during gas measurement. Models available featuring full compliance with EPA Protocols CTM-030 and CTM-034.

The U-Line Series is designed for industrial or commercial use in systems below 239,000 BTU's (70kW). Detect Carbon Monoxide, Nitrous Oxide, and uncombusted hydrocarbons in the exhaust gas from a combustion process. Ensure employee safety and the efficiency of your equipment. Identify maintenance problems that develop over time, as boilers deteriorate and efficiency drops.

Compact and ergonomic units fit in your hand and feature easy to use keys and with a multi-line display. Magnetic rubber holster protects the unit from drops and allows convenient hands free operation. Built-in impact printer produces records that don't fade the way documents printed with thermal printers can. On board memory can hold 250 readings; expand memory capacity with optional flash. This instrument is particularly useful to users with processes using furnaces, engines, turbines, or boilers.

### U-Line 2000 Expanded Features:

- Stores up to 250 Complete Analysis with Customer Name & Address
- Windows Software & USB Cable

### U-Line 3000 Advanced Features: all the above, *plus...*

- RS232 interface
- CO Dilution up to 10%
- Graphic Display with Menu and Zoom Feature
- Smart Auto-zero without Removing the Probe

### U-LINE SERIES FEATURES

**Easy replaceable gas sensors:** uses long life low maintenance sensors for O<sub>2</sub> and CO<sub>2</sub>.

**Standard Report of Calibration:** Each instrument is factory calibrated and certified to ensure traceability, and shipped with a Report of Calibration.

**Rechargeable battery operations:** Rechargeable batteries provide longer field use. Flue gas analyzer and internal printer are powered by the same internal batteries. Charger is supplied standard.

**Keyboard & Display:** Text, menu, and keyboard available in most common languages (not icons) for simple and intuitive operations. Engineering units are selectable by keyboard. Large Backlit multi-parameter LCD display.

**Multi Fuel selection:** Units provide up to 10 fuel profiles for calculating combustion values. Data for the most commonly used fuels is pre-loaded from factory. Other fuels can be added using GasConfig PC software.



*Continued Innovation Since 1836*  
ISO9001:2008 CERTIFIED

Complete Calibration Services Available

## U-Line Series Features

**Built-in impact printer:** The instrument is available with an optional built-in rugged impact printer. It uses low cost, standard rolls of paper which are easy to read, heat resistant, and long lasting.

**Pressure/Draft & Tightness Test:** Differential pressure input to measure low pressure, draft, gas pipework leak with pressure decay program, gas pressure, pressure in combustion chamber, and  $\Delta P$  on filters and fan. The tightness test procedure includes dual report. Safety switch verification.

**Smoke index:** Smoke index measurement is performed by using the optional external hand pump. The results can be stored in the internal memory and printed on a report.

**Ambient CO Safety Monitoring:** A procedure can be selected to monitor the CO in ambient air using the internal sensors. An internal program allows the CO max measurement in atmospheric boiler room test with 15 values logging. An optional external probe is available for continuous surveillance of the ambient air quality for operator safety. This compact unit cools and dries the gas sample. Both acoustic and visual alarm are available.

**Flash memory:** The flash memory allows the instrument to be configured by updating the firmware for any future requirement or product performance upgrading.

### U-Line 2000 & 3000 Expanded Features:

**Gas sampling probe:** Flue gas sampling probes with different lengths and shapes are available to match each specific requirement. Stores up to 250 samples. The sampling probe is connected to the instrument with a single or dual hose through a water trap and a suspended particle line filter.

**Combustion air temperature sensor:** A remote Pt100 probe is available for remote combustion air temperature measurement. This probe is strongly recommended for use in forced air boiler applications to obtain an accurate efficiency measurement.

**Differential Thermometer:** The dual input temperature probes are used in the flue gas analysis for flue and air inlet measurements.

**Type:** palm-top combustion gas analyzer U-Line 1000: 1 or 2 gas sensors, U-Line 2000: 1, 2 or 3 gas sensors. U-Line 3000: 1, 2, 3 or 4 gas sensors.

**Calibration:** automatic calibration procedure at 60 seconds with smart autozero switch-On

**Self-Diagnosis:** Sensors efficiency test with display diagnostic messages.

**Fuel Types:** Up to 10 selectable from keyboard.

**Power Supply:** High capacity rechargeable Li-Ion battery pack / external battery charger.

**Charging Time:** U-Line 1000, 2000: 8 hours at 90% with instrument Off. U-Line 3000: 3 hours at 90% with instrument Off.

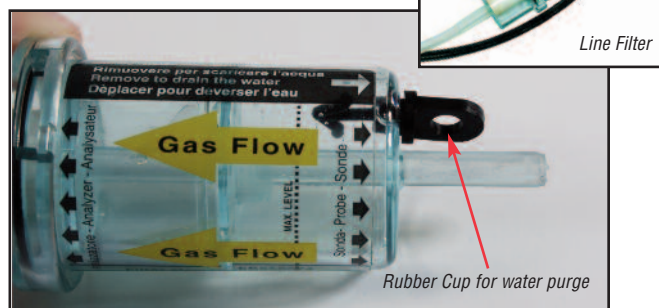
**Battery Life:** U-Line 1000, 2000: 6 hours, U-Line 3000: 10 hours (typical) continuous use (without printing and backlight).

**Memory:** up to 250 full analysis data structured by boilers (Tags).

**Gas leak sniffer:** The instrument can operate in two ways: optional **external** probe is available to locate a gas leak. This probe has a flexible stainless steel shaft to reach difficult locations. An optional **internal** sensor can be installed inside the analyzer to locate a gas leak in the pipe network. The internal pump draws the ambient air and makes the instrument more sensitive to microleaks.

**Industrial Probe & Compact Cooler unit:** A special sampling probe is available for industrial high temperature applications. This probe can be used connected to an external gas conditioning unit. This compact unit cools and dries the gas sample. The cooling unit is strongly recommended for SO<sub>2</sub> and NO<sub>2</sub> long term measurements.

**Patent Pending design trap:** Built-in external protection for water suction, inhibits water from getting into the instrument, preventing risk of damage. Large water tank capacity for high condensing boiler. Small rubber cup for easy water purge. Long life paper filter.



### U-Line 3000 Advanced Features:

**Advanced Diagnostics:** Built-in flow meter with internal leak test. Diagnostic errors on sensor with current indication.

**Autozero valve for quick start-up:** You can install the probe in the stack immediately during the autozero. The instrument will be ready in less than 60 seconds.

**Printer:** Internal impact type 24 columns with 2.28 inch (58 mm) width paper roll.

**Printer Power Supply:** from the analyzer battery pack.

**Print Autonomy:** up to 40 reports with full battery (typical).

**Printed Report Header:** 4 programmable lines.

**Service and User Information:** U-Line 2000, 3000: 3 programmable lines.

**Display:** 1.57 x 2.28 in (40 x 58 mm) alpha-numeric LCD with backlight.

**Serial Communication:** U-Line 2000 & 3000, RS232 interface. USB serial port.

**Infrared Port:** compatible with HP82240B cordless printer.

**Operating Temperature:** 23° to 113°F (-5°C to +45°C) from 10 to 90% RH.

**Storage Temperature:** -4° to 140°F (-20° to +60°C) 3 months maximum at temperatures exceeding the operational limits).

**Dimensions and Weight:** 4.13 x 2.95 x 11.41 in (105 x 75 x 290 mm) - 1.98 lbs (0.9 kg) with battery and printer.



# U-Line Series Specifications

For Residential HVAC use in systems below 239,000 BTU's (70kW)

U-LINE SERIES SPECIFICATIONS						
Parameter	U-Line 1000 Sensor Type	U-Line 2000 Sensor Type	U-Line 3000 Sensor Type	Range	Resolution	Accuracy/1year
O <sub>2</sub>	Electrochemical	Electrochemical	Electrochemical	0 - 25%	0.1%	±0.2% Volume ±0.1% Volume*
CO H <sub>2</sub> compensated	Electrochemical	Electrochemical	Electrochemical	0 - 8000 ppm	1 ppm	±10 ppm < 300 ppm ±4% rdg up to 2000 ppm ±10% rdg elsewhere
CO Diluted	NA		Electrochemical	8000 - 100,000 ppm	500 ppm	±10 ppm < 300 ppm
CO	Electrochemical	NA		0 - 4000 ppm	1 ppm	±10 ppm < 300 ppm
NO	NA		Electrochemical	0 - 4000 ppm	1 ppm	±5 ppm < 125 ppm ±4% rdg up to 4000 ppm
LOW NO	NA		Electrochemical	0 - 500 ppm	0.1 ppm	± 2 ppm < 40 ppm ±5% rdg up to 500 ppm
NO <sub>x</sub>	NA		Calculated	0 - 5000 ppm		
SO <sub>2</sub>	NA		Electrochemical	0 - 4000 ppm	1 ppm	± 5 ppm < 125 ppm ±4% up to 4000 ppm
CO <sub>2</sub>	Calculated	Calculated	Calculated	0 - 99.9%	0.1%	
T air	Pt100	Pt100	Pt100	-10 - 100°C	0.1°C 1°C*	±0.5°C ±0.2% rdg + 0.15°C*
T gas	TC K	TC K	TC K	0 - 600°C 0 - 1000°C*	0.1°C 1°C*	± 1°C ±0.3% rdg + 0.3°C*
ΔT	NA		Calculated	0 - 999.9°C	0.1°C	
T flow	NA		TC K	-10 - 100°C	0.1°C	±0.3% rdg + 0.3°C
T return	NA		TC K	-10 - 100°C	0.1°C	±0.3% rdg + 0.3°C
Pressure	Piezo Resistive	Piezo Resistive	Piezo Resistive	-10 - 120 hPa 0 - 200 mbar*	0.01 hPa 0.1 mbar*	±3Pa < 300Pa ±1% rdg elsewhere ±0.5 mbar < 50 mbar* ±1% rdg > 50 mbar*
Draft	Piezo Resistive	Piezo Resistive	Piezo Resistive	-10 - 120 hPa ±40.00 hPa*	0.01 hPa	±3Pa < 300Pa ±1% rdg elsewhere ±0.03 hPa < 300 Pa* ±1% rdg > 300 Pa*
Excess Air	Calculated	Calculated	Calculated	1.00 - Infinity	0.01	
Efficiency	Calculated	Calculated	Calculated	1 - 120%** 1 - 99.9%	0.1%	(also for condensing boilers with automatic detection)

- Relative Accuracy limits are stated as absolute or % of reading with reference to the ambient temperature range from -5°C to 40°C. Additional ± 1 digit error has to be considered.
- All emissions measurements are also available with a programmable O<sub>2</sub> reference value.
- NO<sub>x</sub> concentration can be shown in terms of stack equivalent NO<sub>2</sub>
- The pressure relative accuracy shown is valid only after the autozero procedure.
- Measuring readings can be directly converted from ppm to mg/Nm<sup>3</sup>, mg/kWh, from hPa to mmH<sub>2</sub>O, mbar, inH<sub>2</sub>O and from °C to °F.

Specifications subject to change without notice  
 \* U-Line 3000 \*\* U-Line 1000

## Applications

- Boiler, Burner, Engine and Furnace Tuning and Maintenance
- Draft, Gauge and Differential Pressure Measurements
- Search for Presence and Location of Gas Leaks
- Operator Safety with Ambient CO and O<sub>2</sub> Continuous Monitoring

### DBGas 2004 - Gas Analysis Database Manager

U-Line 2000 and 3000 series analyzers can store 250 readings structured by boilers. Using the optional DBGas 2004 Windows software package, you can organize and manage your inspection and maintenance activity. Select your boiler details from PC and download to your unit. DBGas 2004 software package includes GasConfig Windows software. With this software you can modify the configuration of the instrument.

Complete Calibration Services Available





**U-Line Series Accessories**

U-Line Series Accessories Ordering Form	
Transport Cases & Protection	
BB880028	ABS Rigid Carrying Case
BB880043	Vinyl Carrying Case with Shoulder Strap
EE880047	Rubber Holster with Magnetic Support
Probes & Sensors	
BB610051	180mm Gas/Draft Probe (Dual Hose) Max 500°C *
BB610046	300mm Gas/Draft Probe (Dual Hose) Max 500°C *
BB610080	750mm Gas/Draft Probe (Dual Hose) Max 500°C **
BB830009	Ambient CO Probe
BB830010	Gas Leak Detector Probe (Sniffer)
BB830018	PT100 Remote Air Sensor, 2m Cable and Positioning Cone
BB830025	External Probe for Natural Boiler Draft (200Pa) *
F2132100	130mm Air TC Type K Probe
F2137100	130mm Contact TC Type K Probe
F2139000	Pipe Velcro TC Type K Probe
F2139100	TC Type K Clamp Temperature Probe *
F2139200	Pt100 Clamp Temperature Probe *
BB610057	3m Extension for Dual Hose Sample Probe and TC *
BB610103	6m Extension for Dual Hose Sample Probe and TC *
Test Tools & Miscellaneous	
EE300088	Single Hose Pressure Probe and Burner Hose Kit
2XE300088	Double Hose Kit for Differential Pressure Measurement *
EE300248	Leak Test Kit (Pump + Hose + Adaptors) *
EE620054	Rechargeable Li-ION Battery Pack
F7828000	Manual Pump for Smoke Index Measurement + 40 Filters + Table
Software & Connectors	
BB260166	DBGas 2004 Standard Software
BB260224	DBGas 2004 Standard Upgrade*
EE700476	USB Adaptor Cable
Printer Accessories	
EE340005	Printer Paper Roll 10/pkg for U-Line 1000 & U-Line 2000
EE340006	Printer Paper Roll 10/pkg for U-Line 3000
EE490002	Printer Ribbon 3/pkg
EE650011	Soot Filter (40 pieces/pkg)
EE650074	Filter Cartridge for EE650076/EE650082 Water Trap 10/pkg

\* U-Line 2000 & 3000 only \*\* U-Line 3000 only



**BB880028** ABS Rigid Carrying Case



**BB880043** Vinyl Carrying Case with Shoulder Strap



**BB830009** Ambient CO Probe



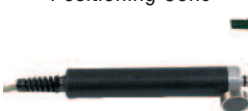
**BB830010** Gas Leak Detector Probe (Sniffer)



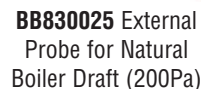
**BB830018** PT100 Remote Air Sensor, 2m Cable and Positioning Cone



**BB610046** 300mm Sampling Dual Hose Probe (Gas and Draft) Max 800°C



**F2132100** 130mm Air TC Type K Probe



**BB830025** External Probe for Natural Boiler Draft (200Pa)



**F2139000** Pipe Velcro TC Type K Probe



**F2137100** 130mm Contact TC Type K Probe



**F2139100** TC Type K Clamp Temperature Probe



**F2139200** Pt100 Clamp Temperature Probe



**F7828000** Manual Pump for Smoke Index Measurement



**EE300248** Leak Test Kit (Pump + Hose + Adaptors)



**EE650011** Soot Filter (40 pieces/pkg)



**EE700476** USB Adaptor Cable

