TEST iNSTRUMENTS™

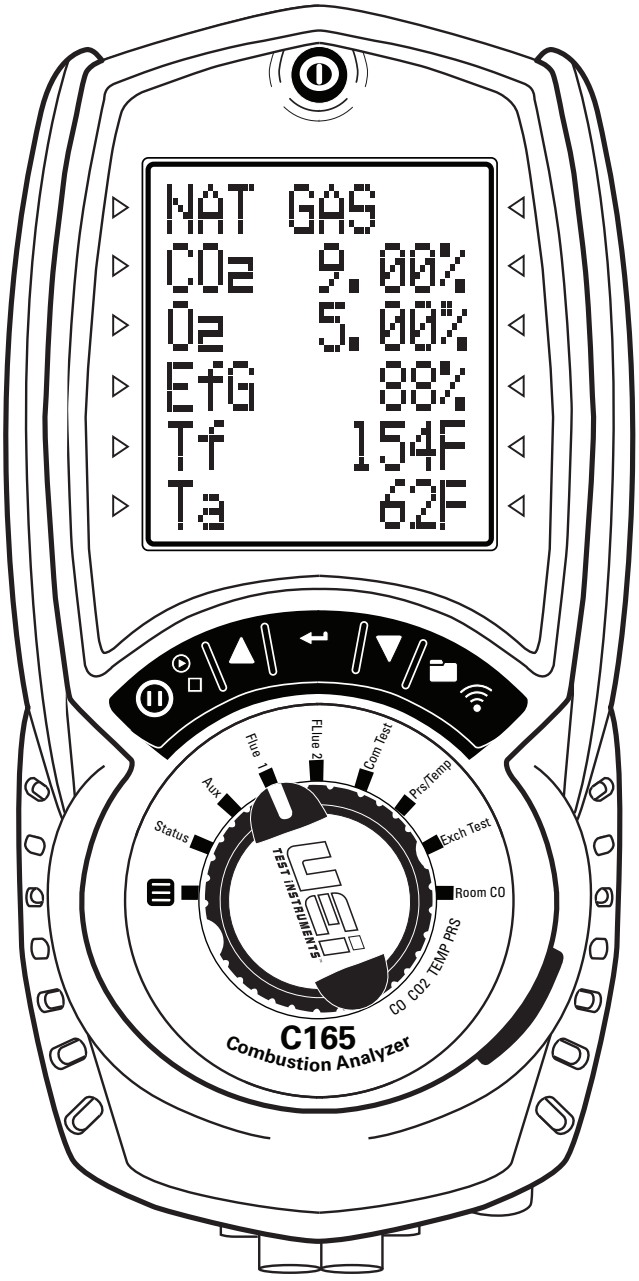
C165

Residential/Commercial Combustion Analyzer

EOS ELECTRO-OPTICAL SENSOR TECHNOLOGY

INSTRUCTION MANUAL

ENGLISH



CE

RoHS Compliant

REACH Compliant

1-800-547-5740 • Fax: (503) 643-6322
www.ueitest.com • Email: info@ueitest.com

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FUNCTIONS

- **Flue temperature:** 32° to 1112°F
- **Inlet temperature:** Internal/ External sensor 32° to 112°F
- **O_2:** 0 - 21%
- **CO:** 2000 ppm
- **CO_2:** 0 - 20 %
- **Efficiency:** Nett/Gross 99.9%
- **Efficiency:** High (calculated) 119.9%
- **Excess air:** 250%
- **CO/CO_2 ratio:** 0.99%
- **Differential pressure**

FEATURES

- **EOS Technology**
- **Pre-programmed fuels:** Natural Gas, Propane, Butane, LPG, Light Oils (28/35 sec), Woodpellets, Town Gas, Coke Gas, Biogas, Biofuel
- **Memory Positions:** 30
- **6 line backlit display**
- **High altitude compensation**
- **User customizable parameter views**
- **Individual report printouts**
- **Real-time clock**

GENERAL SPECIFICATIONS

- **Operating Temperature:** 32° to 112°F (0° to 45°C)
- **Storage Temperature:** 0° to 120°F (-18° to 50°C)
- **Operating Humidity:** 10% to 90% R.H.
- **Back light:** Yes
- **Dimensions:** 7.87 x 1.77 x 3.5 inch
- **Item Weight:** 1.35 lb
- **Calibration:** Recommended Annually
- **Certification:** CE Conformity, RoHS, REACH Compliant, AHRI 1260 standard
- **Battery Size:** Alkaline or NiMH AA 3
- **Accuracy:** ± (% of reading + # of least significant digits)

IMPORTANT SAFETY WARNINGS

⚠ Read entire Safety Notes section regarding potential hazard and proper instructions before using this analyzer. In this manual the word "**WARNING**" is used to indicate conditions or actions that may pose physical hazards to the user. The word "**CAUTION**" is used to indicate conditions or actions that may damage this instrument.

⚠ WARNING

To ensure safe operation and service of the tester, follow these instructions. Failure to observe these warnings can result in severe injury or death.

⚠ WARNING

- Do not use this analyzer during electrical storms or in wet weather.
- To avoid false readings, charge batteries if a low battery indicator appears.
- Always adhere to national and local safety codes. Use proper personal protective equipment (PPE)

⚠ WARNING

This analyzer extracts combustion gases that may be toxic in relatively low concentrations. These gases are exhausted from the back of the analyzer.

This analyzer must only be used in well-ventilated locations by trained and competent persons after due consideration of all potential hazards.

Users of portable gas detectors are recommended to conduct a "bump" check before relying on the unit to verify an atmosphere is free from hazard. A 'bump" test is a means of verifying that an instrument is working within acceptable limits by briefly exposing to a known gas mixture formulated to change the output of all the sensors present.

NOTE: *This is different from a calibration where the instrument is also exposed to a known gas mixture but is allowed to settle to a steady figure and the reading adjusted to the stated gas concentration of the gas of the test gas.*

SYMBOLS

	**Low Battery**	˚F	**Degrees Fahrenheit**
˚C	**Degrees Celsius**		**Menu**
	**Pump Start**		**Pump Stop**
	**Navigate Down**		**Navigate Up**
	**Enter Key**		**Wireless/Store/Print**

ANALYZER OVERVIEW

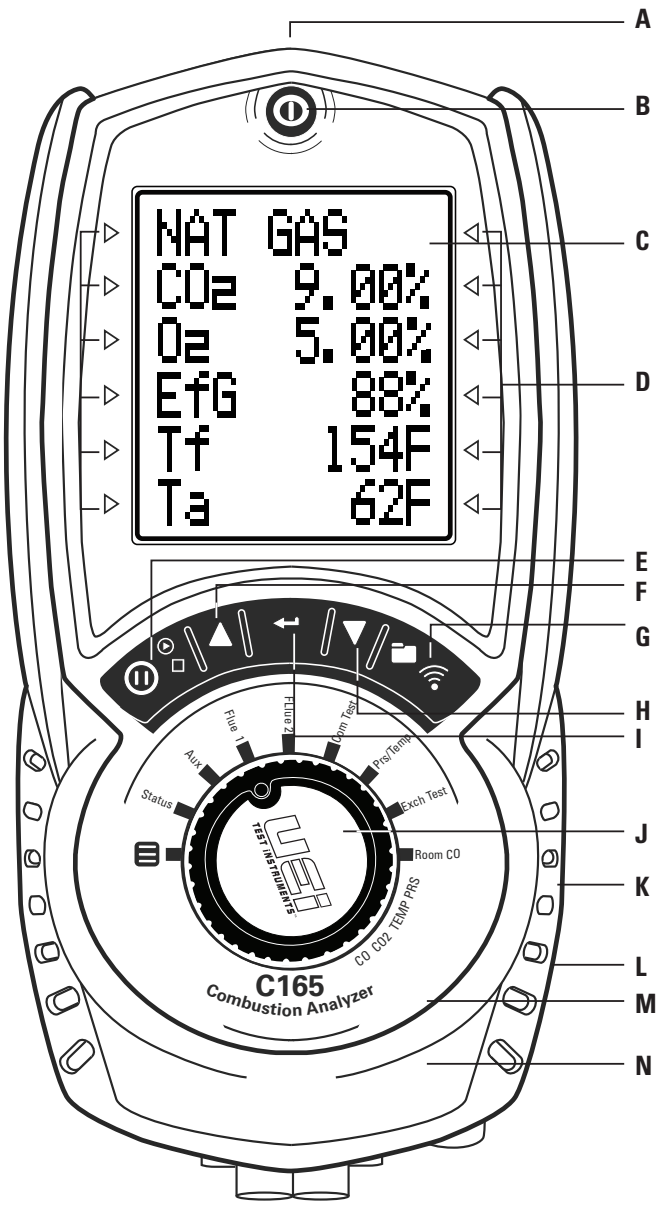
A. Infrared Printer Port
B. On/ Off (Power) Button
C. 6 Line Backlit Display
- Press any button to turn Back light on (backlight duration can be set in Menu/Screen/Backlight)

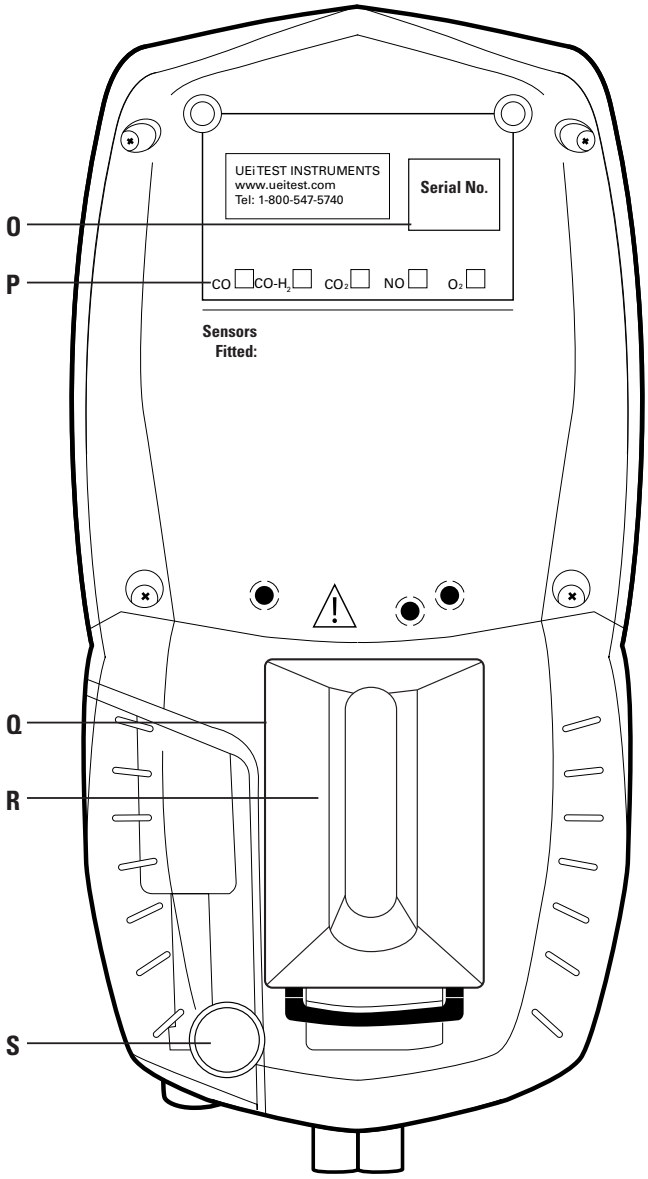
D. Display Line Lights
E. Pump Toggle Button: short press is data hold, long press turns pump on and off
F. UP Button
- Short press to navigate "UP"

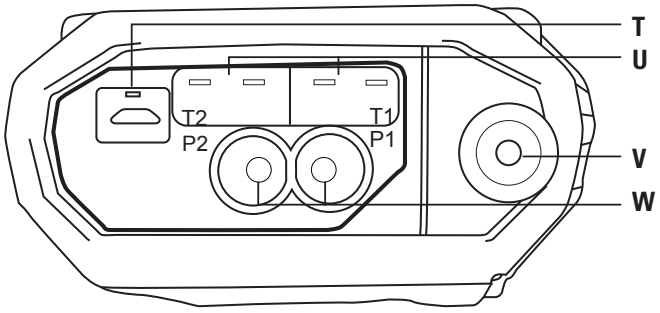
G. Wireless/Store/Print Button: short press print, long press store
H. Down Button: short press moves down, long press does a fresh air purge
I. ENTER Button: short press works as enter, long press turns on work light
J. Rotary Selector Dial
K. Particle Filter (inside water trap)
L. Water Trap
M. LED Water Trap Indication
N. Protective Rubber Boot with Magnets
O. Serial Number QR Code: (Serial Number viewable under Protective Boot)
P. Sensors Fitted: (label under Protective Boot) Sensors that can be fitted in unit when shipped (CO-H2, CO, CO_2, NO, O_2)
Q. Battery Compartment: (under Protective Boot)
R. Grip Indentation: Indentation for fingers to grip analyzer
S. Water Trap Drain Plug (Red plug; take caution NOT to damage plug when removing protective boot)
T. Battery Charge USB Adapter Connection
U. Temperature Connections
- Flue Probe Temperature: T1
- Inlet Temperature: T2

V. Flue Gas Inlet Connection
W. Pressure Connections
- Pressure: P1
- Differential Pressure: P2

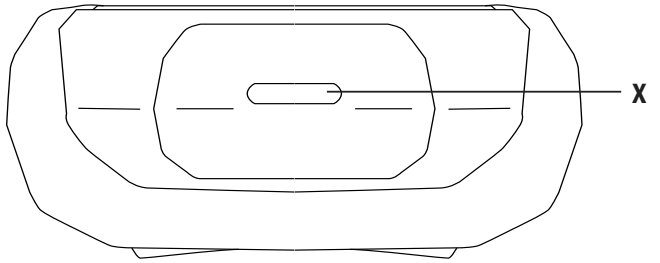
X. Infrared Printer Port


A
B
NAT GAS
CO2 9.00%
O2 5.00%
EfG 88%
Tf 154F
Ta 62F
C
D
E
F
G
H
I
Flue 1
Flue 2
Comb Test
Prs/Temp
Exch Test
Room CO
Aux
Status
J
K
L
M
N
C165
Combustion Analyzer
CO CO2 TEMP PRS

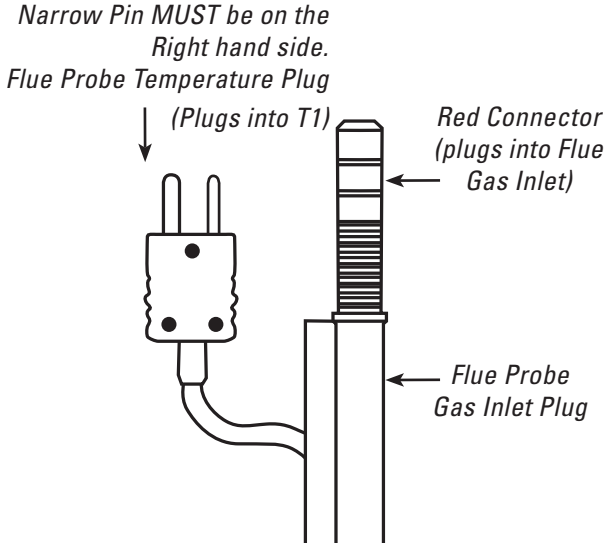

UEi TEST INSTRUMENTS
www.ueitest.com
Tel: 1-800-547-5740
Serial No.
O
P
CO
CO-H2
CO2
NO
O2
Sensors Fitted:
Q
R
S


T
U
T2
T1
P2
P1
V
W

[BOTTOM]


X

[TOP]


Narrow Pin MUST be on the Right hand side.
Flue Probe Temperature Plug
(Plugs into T1)
Red Connector (plugs into Flue Gas Inlet)
Flue Probe Gas Inlet Plug

OVERVIEW

The C165 Combustion Analyzer measures CO, CO_2, differential temperature and differential pressure.

CO_2 is set to zero in fresh air automatically after the initial countdown.

It is important that re-zeroing is done in outside fresh air as indoor CO_2 levels are affected by human breath.
It calculates oxygen (O_2), CO/CO_2 ratio, Losses, Combustion Efficiency (Gross, Nett, Gross Condensing, or Nett Condensing).

The C165 Combustion Analyzer can also measure CO levels in ambient air - useful when a CO Alarm is triggered. It can also perform a Room CO Test for 30 minute duration.

A structured Commissioning Test has been included for the installation of boilers.

A low flow detection system warns of low flow and switches the pump off. This also helps to prevent water ingress from overfilled water traps.

The analyzer has a protective rubber boot with magnets for hands-free operation and is supplied with a probe with an integral temperature sensor.

A large 6 line display provides the user with relevant information. All data can be printed via the infrared printer or Wireless Printer App.

The C165 uses a new data storage system allowing the user to store the maximum number of logs of interest to them, rather than be restricted to an allowance of particular logs.

The memory can store up to 30 logs of any combination of Combustion, AUX, Temperature, Heat Exchanger, Room CO, Commissioning tests.

PRE TEST CHECKLIST

- Clean particle filter
- Water trap and probe line are empty of water
- Power on and zero
- All hose and thermocouple connections are properly secured
- Flue gas probe is sampling ambient FRESH air
- Water trap is fitted correctly to the instrument
- Flue temperature plug is connected
- Ensure water trap plug is inserted correctly

SETTING INLET TEMPERATURE

- Turn on and zero the analyzer, without the flue probe connected, to use ambient temperature
- Connect the flue probe thermocouple to T1 during zero countdown use for inlet ducted system
- Connect a thermocouple to T2 to measure second temp source

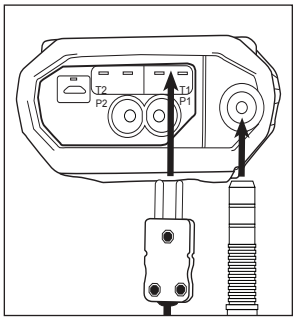
ANALYZER CONNECTIONS

⚠ WARNING

Turning the pump off while the probe is in the flue will leave toxic gases inside the analyzer. Once data has been printed or copied, it is advisable to purge the unit with fresh air as soon as possible. To do this remove the probe from the flue and turn ON pump. Always allow the readings to return to zero (20.9% for O_2) prior to shutting the unit off. The meter will not switch off until the CO reading is below 20 ppm.

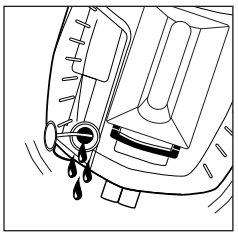
⚠ CAUTION

The probe will be hot from flue gases. Remove the probe from the flue and allow it to cool naturally. Do not immerse the probe in water, as this will be drawn into the analyzer and damage the flue probe and the pump and sensors.



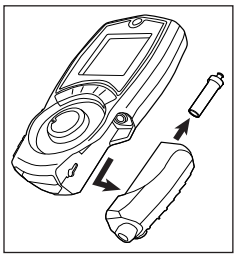
NOTE: *Take care when inserting the temperature probes as the pins are polarized. Insert with the smaller pin (+) to the right.*

EMPTYING & CLEANING THE IN-LINE WATER TRAP



- Remove the rubber plug
- Allow the water to drain out
- Re-insert the rubber plug

CHANGING THE PARTICLE FILTER



- Remove the protective rubber boot
- Slide the water trap unit from the analyzer
- Remove the particle filter from its' spigot and replace
- Slide the water trap back into position and replace the protective rubber boot

QUICK START

Turn on the analyzer by pressing the On/Off Button for 2 seconds until the unit activates. As described the analyzer will perform a 60 second turn on purge. Once completed simply select the reading desired by the position of the rotary dial.

FRESH AIR PURGE

⚠ NOTE

Each time the analyzer is turned on it will perform a 60 second air purge, this is to clear the gas sampling path (including probe, if connected). For these reasons it is very important that the analyzer be in **outside fresh air** when powered on.

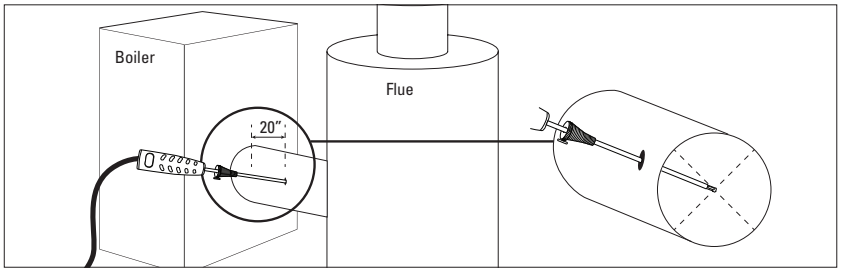
CO OVER-RANGE PROTECTION PUMP

The analyzer's intelligent protection system will automatically activate the protection pump once an over-gas condition is detected (see specification table for detection limits). When activated the main sampling pump will be shut down, allowing the sample system to be purged with fresh air. Once readings have returned to a safe level, the protection pump will shut down and the main pump will reactivate.

MEASURING FLUE GASES

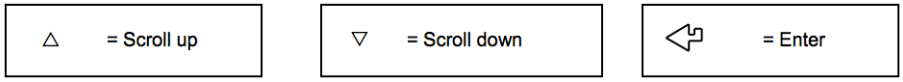
After the initial countdown is finished and the analyzer is properly setup, put its' flue probe in the appliance's sampling point. The tip of the probe should be at the center of the flue. Use the flue probes depth stop cone to set the position.
With balanced flues, make sure the probe is positioned into the flue so no air can "back flush" into the probe.

CAUTION!: *Ensure the flue probe handle does not get hot!*



USING THE MENU

Select "Menu" on the rotary switch and navigate using the function buttons:



NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

SETUP
UNITS
SCREEN
REPORT
SERVICE

As you scroll up or down the side LEDs illuminate to point to the active line

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
SETUP	LANGUAGE	English
	SET TIME	HH:MM:SS format e.g. 7 am = 07:00:00, 7pm = 19:00:00
	SET DATE	MM/DD/YY format
	PRINTER	KM IRP KANE IRP-2 WIRELESS (if installed) SERIAL
	PASSKEY	1111 (wait 5 secs after entering last digit)
	BACK	

As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
UNITS	FUEL TYPE	NAT GAS, TOWN GAS, COKE GAS, PROPANE, BUTANE, LPG, LIGHT OIL, BIO OIL, WOOD PELLETS, BIO GAS, USER 1 to 5
	FUEL ORIGIN	UK, FRANCE, SPAIN, N AMERICA, BELGIUM, NETHERLAND
	EFFICIENCY	GROSS, NET, GROSS COND, NET COND
	PRESSURE	See next table below
	GAS	ppm, ppm(n), mg/m3, mg/m3(n), mg/kWh, mg/kWh(n)
	TEMP	C, F
	O_2 REF	Up/down to set value (3% default)
	NOx CALC	Up/down to set value (5% default)
	BACK	

As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
PRESSURE	FILTER	FILTER OFF = normal response. ON = slower (damped) response
	RESOLUTION	LOW = e.g. 0.00i inH20 resolution. HIGH = displays to an extra decimal place
	UNITS	mbar, Pa, PSI, mmHg, hPa, inH2O, mmH20, kPa, psi
	BACK	

As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
SCREEN	CONTRAST	Factory setting is 14
	BACKLIGHT	0 to 300 secs
	AUX	Enables users to customize the parameters on the AUX display: LINE 1, LINE 2, LINE 3, LINE 4, LINE 5, LINE 6, BACK
	BACK	

As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
REPORT	AUX	Stored AUX tests VIEW, DEL ALL, BACK
	COMBUSTION	Stored combustion tests: VIEW, DEL ALL, BACK
	COMMISSION	Stored commission tests: VIEW, DEL ALL, BACK
	PRS/TEMP	Stored pressure tests: VIEW, DEL ALL, BACK
	EXCH	Stored exchange tests: VIEW, DEL ALL, BACK
	ROOM CO	Stored room CO tests: VIEW, DEL ALL, BACK
	HEADER	LINE 1 LINE 2 BACK
	BACK	

As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

MAIN MENU	SUB MENU	OPTIONS / COMMENTS
SERVICE	CODE	Password protected for authorized service agents only. Leave set to 000000.

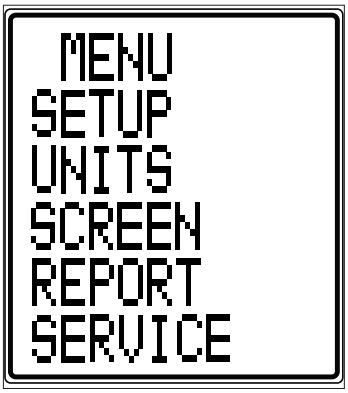
As you scroll up or down the side LEDs illuminate to point to the active line

NOTE: To "EXIT" the "MENU" at any time simply move the rotary switch to any position other than "Menu". Any changes that have not been "entered" will be ignored.

USING THE MENU

The Menu position on the Rotary Dial allows for the customization of the default settings for the analyzer as per the user's requirements. Navigation through the Menu system is via the dedicated user's interface buttons (Up, Down, Enter).

As you navigate up or down through the Menu, the items will scroll accordingly, eventually back to the beginning.



Rotate Selector Dial to **MENU** to set up or customize your settings.

Selected parameter are centered, highlighted with arrow icons on either side.

Use ▲ and ▼ buttons to scroll menu options.

Press ↵ to a select a parameter to edit. Press ↵ button to scroll fields to change.

Press ▲ and ▼ buttons to change field contents.

Press ↵ to enter content selected.

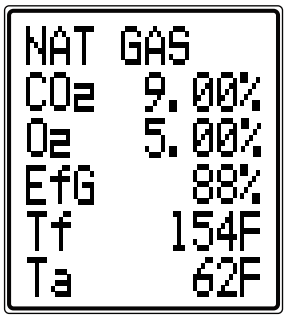
The analyzer will perform a 60 second purge in Rotary Dial settings of Aux, Flue 1and Flue 2. This should be done in fresh air.

COMBUSTION TESTS

Insert the tip of the flue probe into the center of the flue. The readings will stabilize within 60 seconds assuming the system conditions are stable.

The rotary switch can be used to display the following information:

FLUE 1

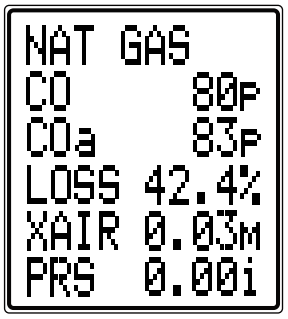


Fuel type can be changed via "MENU" or "STATUS" setting.
Carbon Dioxide (%)
Oxygen (%) left after combustion. Should be 20.9% ± 0.3% in fresh air.
Gross efficiency
Flue temperature (°F).
Inlet temperature (°F). Normally set by flue probe during fresh air purge.

Press 📁 to print a full combustion test, (or send to Smart Device via optional Wireless module).

Hold 📁 for 2+ seconds to log a full combustion report.

FLUE 2



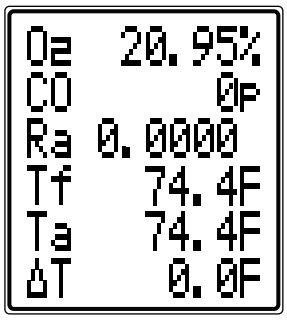
Fuel type can be changed via "Menu" or "STATUS" setting.
Carbon monoxide (ppm).

Losses calculated
Excess air %
Pressure reading

Press 📁 to print a full combustion test, (or send to Smart Device via optional Wireless module).

Hold 📁 for 2+ seconds to log a full combustion report.

AUX display



The AUX (auxiliary) display can be customized via “MENU” / “SCREEN” / “AUX”.
The parameters displayed on lines 1, 2, 3, 4, 5 and 6 can be set by the user.
They remain the AUX parameters until changed by the user.

Press to print a full combustion test, (or send to Smart Device via optional Wireless module).

Hold for 2+ seconds to log a full combustion report.

COMBUSTION TEST - OPTIONAL NITRIC OXIDE SENSOR

Instructions for C165 Analyzers fitted with optional Nitric Oxide (NO) sensors

Displaying the Nitric Oxide (NO) reading

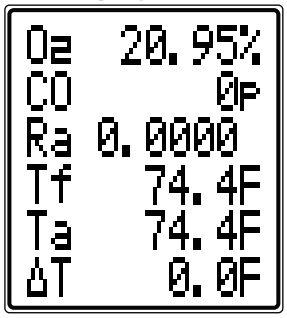
Select “Menu” on the rotary switch and navigate using the function buttons:

△ = Scroll up	▽ = Scroll down	⇦ = Enter

Select SCREEN and then select AUX

Choose a line to display the required readings as below

AUX display



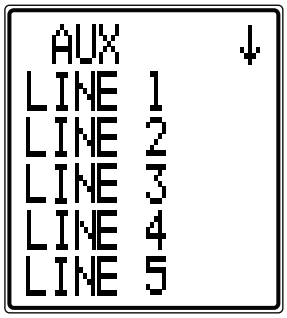
The AUX (auxiliary) display can be customized via MENU / SCREEN / AUX.
The parameters displayed on lines 1, 2, 3, 4, 5 and 6 can be set by the user.
They remain the AUX parameters until changed by the user.

NOTE: To EXIT the **MENU** at any time simply move the rotary switch to any position other than MENU. Any changes that have not been “entered” will be ignored.

Use ▲ and ▼ to navigate to the main menu option SCREEN Press ↵.

Use ▲ and ▼ to navigate to the sub menu option AUX Press ↵.

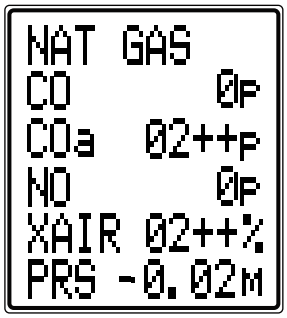
The display will show



Press ↵ and a third line will appear.

Use ▲ and ▼ to navigate to the desired parameter to be displayed on line 1.

Press ↵ to select the parameter for Line 1 and repeat the process to select the display parameter for all four lines and then EXIT. Rotate the dial from MENU to AUX to display all your chosen settings.



PRINTING and STORING

The NO readings are printed and stored in the same way as the other combustion gas readings. On the printouts the NO readings appear directly below the flue CO readings. OR AUX

The dial needs to be in the Flue position or AUX to print or store. When the dilution pump is operating to protect the CO sensor the NO readings are also affected by an unspecified amount. The screen will typically show:

COMMISSIONING TEST

The Commissioning Test is based on TB143
Introduced in April 2013, Technical Bulletin 143 from the Heating and Hotwater Industry Council (HHIC), outlines a safer, clear and comprehensive procedure for commissioning condensing boilers without airgas ratio valves. Rotate the dial to "**COM TEST**" position and follow the instructions on the screen

TEST 1
Check the boiler at High Fire rate. (Max GAS)
The boiler is switched on at High Fire rate. (Max GAS)
The analyzer is first zeroed in **outside fresh air**.
Once the boiler is stable at high fire rate the probe is inserted into the air inlet of the flue and the CO_2 level is measured. The reading needs to be stable and less than or equal to 0.20%.

TEST 2
The probe is then inserted into the exhaust outlet of the boiler and the Ratio, CO and CO_2 levels are measured. These levels must be as per manufacturers instruction. Where manufacturer's instructions are not available the CO must be less than 350 ppm and the RATIO must be less than 0.0040.

TEST 3
Checks the boiler at Low Fire flow rate where this is possible.
With the boiler operating stably at Low Fire rate the Ratio, CO and CO_2 levels are measured. MIN GAS
These levels must be as per manufacturers instruction. Where manufacturers' instructions are not available the CO must be less than 350 ppm and the Flue 2 must be less than 0.0040.

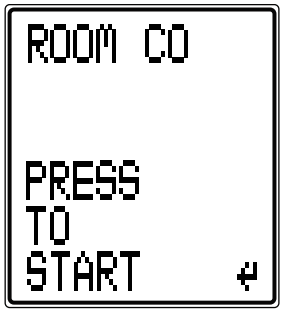
TEST 4
Measures Flow and Return Temperatures from the boiler
All the measured readings are logged and can be printed or transmitted to PC if an optional wireless module is fitted.

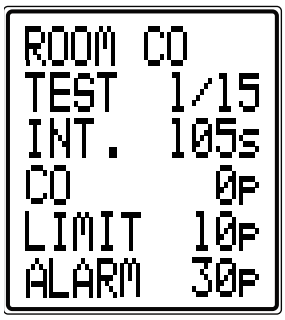
HEAT EXCHANGER INTEGRITY TEST

There are many methods to test heat exchange integrity. One of these is to observe the Excess Air, O_2 and CO readings both before and after the blower turns on. If the heat exchanger is sealed, your O_2 and CO readings should remain fairly stable. A breach in the heat exchanger may allow fresh air to be forced into the flue after the blower turns on due to pressure increase in the plenum. The result may be a rise in the measured O_2 in the stack gas and an increase in Excess Air. In some sealed systems the fresh air drawn in through the breach may reduce the combustion air available leading to an increase in the CO reading. If either of these situations are present it is probable there is a problem with the Heat Exchanger which may require additional testing and inspections.

NOTE: Many cracks are invisible to borescopes or the naked eye, and only open or separate from pressure or temperature changes during operations. Rotate dial to "**EXCH TEST**" Rotate test selector to "**EXCH TEST**". Call for heat on the system. Observe and wait for O_2 readings to stabilize.

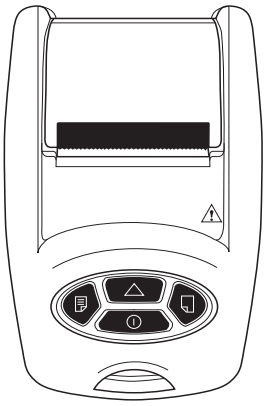
ROOM CO TEST



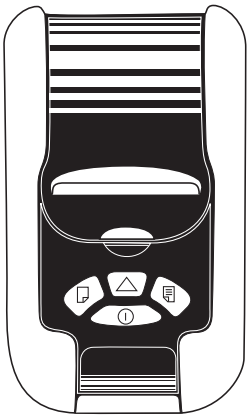


No probes or hose connections are required for this test.
Rotate selector dial to Room CO
Press Enter Button to select GENERAL test type
CO readings will be logged every 2 minutes for 30 minutes.
Readings will be saved once the 30 minute test is completed.
Test results and LOG number will be displayed.
Press Print Button to Print the test results.
This LOG will be saved in the REPORTS/ROOM CO MENU screen.

PRINTING



[IRP2]



[KMIRP2]

Rotate selector Dial to **Menu** Position.

Use ▲ **or** ▼ **Arrow Buttons** to select Printer.

Press ↵ button.

Use ▲ **or** ▼ **Arrow Buttons** to select Printer type (Wireless, KM IRP, Kane IRP-2, Serial)

Wireless Printer App

Please see pages 15 and 16

To charge Printer (if one is included with Printer) please use included USB Cable

PRINTOUTS

COMBUSTION

C165 SW19392 V1.00

YOUR COMPANY NAME & PHONE NUMBER HERE

SERIAL NO.		9876543210
LOG NO.		01
DATE		19/01/18
TIME		11:06:09
CAL DUE ON		18/12/18

COMBUSTION

FUEL TYPE		NAT GAS
CO2	%	9.0
O2	%	5.1
CO	ppm	50
NO	ppm	-N/F-
NOx	ppm	-N/F-
FLUE	°F	149.4
INLET	°F	62.9
NETT	°F	86.5
CO/CO2		0.0005
NET	%	97.9
LOSS	%	2.1
XAIR	%	32
PRS	mbar	0.21

CUSTOMER

APPLIANCE

REFERENCE

COMMISSION TEST

C165 SW19392 V1.00

YOUR COMPANY NAME & PHONE NUMBER HERE

SERIAL NO.		9876543210
LOG NO.		08
DATE		19/01/18
TIME		11:50:04
CAL DUE ON		18/12/18

COMMISSION TEST

ANALYZER ZERO

CO2	%	0.00
CO	ppm	0

FLUE INTEGRITY

CO2	%	0.00

MAX GAS FLOW

CO2	%	9.1
CO	ppm	50
CO/CO2		0.0005

MIN GAS FLOW

CO2	%	9.0
CO	ppm	48
CO/CO2		0.0005

FLOW & RETURN

T1	°F	149.9
T2	°F	62.9
ΔT	°F	86.5

CUSTOMER

APPLIANCE

REFERENCE

PRS/TEMP

C165 SW19392 V1.00

YOUR COMPANY NAME & PHONE NUMBER HERE

SERIAL NO.		9876543210
LOG NO.		20
DATE		19/01/18
TIME		12:23:59
CAL DUE ON		18/12/18

PRS/TEMP

PRS	mbar	18.01
T1	°F	167.9
T2	°F	149.4
ΔT	°F	18.5

CUSTOMER

APPLIANCE

REFERENCE

HEAT EXCHANGE

C165 SW19392 V1.00

YOUR COMPANY NAME & PHONE NUMBER HERE

SERIAL NO.		9876543210
LOG NO.		04
DATE		19/01/16
TIME		11:09:16
CAL DUE ON		18/12/16

EXCHANGE

PRIOR TO BLOWER ON

CO	ppm	23
O2	%	7.0
XAIR		50.3
DATE		19/01/16
TIME		11:09:16

AFTER BLOWER ON

CO	ppm	14
O2	%	7.5
XAIR	%	5
DATE		19/01/16
TIGHTNESS	MINS	TIME

VARIANCE

△CO	ppm	-9
△O2	%	0.5
△XAIR	%	5.6

CUSTOMER

APPLIANCE

REFERENCE

AUX

C165 SW19392 V1.00

YOUR COMPANY NAME & PHONE NUMBER HERE

SERIAL NO.		9876543210
LOG NO.		01
DATE		19/01/18
TIME		09:46:53
CAL DUE ON		18/12/18

AUX

FUEL TYPE		LIGHT OIL
CO2	%	0.53
CO(n)	ppm	02++
CO/CO2		0.0000
O2	%	20.2
FLUE	°F	-N/F-
INLET	°F	-N/F-

CUSTOMER

APPLIANCE

REFERENCE

Install the App

- Free download from Apple® App store
- Search for "Kane Wireless Printer" and install

Upon opening App the first time, it will ask you a series of questions:

- Allow access to device location (GPS)
- Allow access to contacts (for emailing)

Kane Wireless Printer App Home iOS Screen

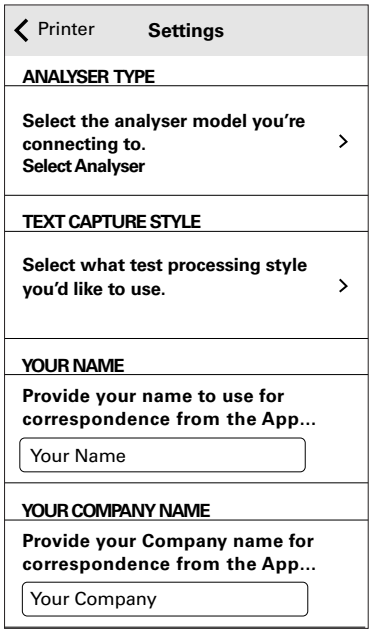
Pairing the Kane Wireless Printer app with your Analyzer

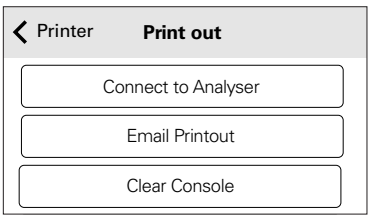
Turn on your analyzer allowing a complete startup

In the App Press **PRINTOUT**

Select **CONNECT TO ANALYZER**

- Your Analyzer's serial number, proceeded by a "K", should appear
- Select your analyzer to pair





Kane Wireless Printer App Home Screen

Print to App from Analyzer

- When testing in AUX, FLUE 1, FLUE 2, Temp/PRES, HEAT EXCH screen
- Press **FILE (Wireless) Button** to enter print menu
- Scroll **ARROW Button** to select Wireless
- Press **Button** to print to App

To Disconnect an analyzer

- Select disconnect from Printout screen

Adding Notes & Emailing from the Kane Wireless Printer App

In PRINTOUT screen, Select EMAIL PRINTOUT

- A message window will open
- Enter email address
- Add message/notes to Printout
- Send message

Select CLEAR CONSOLE to delete a Printout

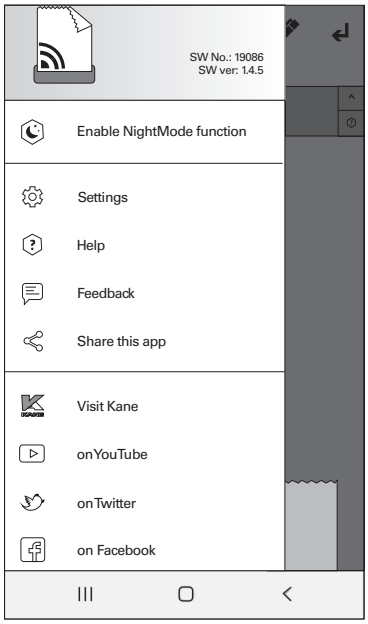
- Press to Confirm deletion

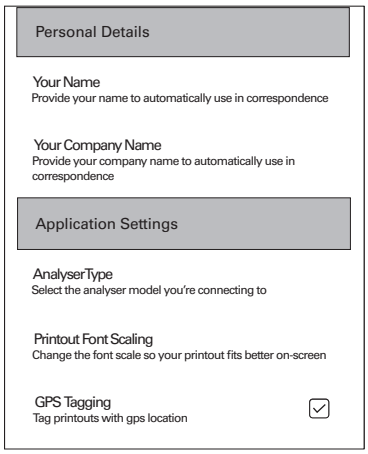
To print Saved LOGS from Analyzer to App

To print Saved LOGS from Analyzer to App

- Rotate Selector dial to MENU
- Press **or** **Arrow Buttons** to select LOGS. Press **Button**
- In the LOGS screen. Press **Button** to VIEW.
- Press **or** **Arrow Buttons** to select LOGS VIEW you want. Press **Button**

ANDROID APP ON Google play





Installing the App

- Free download from Google Play
- Search for "Kane Wireless Printer" and install

Upon opening App the first time, it will ask you a series of questions:

- Allow access to device location (GPS)
- Allow access to contacts (for emailing)

Kane Wireless Printer App Home Android Screen

Start up

- Press the **Menu icon** in top left of screen
- Press Settings
  - A. Select "Your Name", enter name and Press "OK"
  - B. Select "Your Company Name", enter name and Press "OK"
  - C. Select "Analyser Type" select "Other Kane Analyser"

Kane Wireless Printer App Android Settings Screen

Pairing the Kane Wireless Printer app with your Analyzer

- Turn on your analyzer and allow it to complete its startup
- Touch the Kane Wireless Printer banner of the home page
- From the "Pick a device" screen, touch "Scan For Devices" at the bottom of the page
- Your Analyzer's serial number, proceeded by a "K", appears of the list. Select it to pair

Print to App from Analyzer

- When testing in AUX, FLUE 1, FLUE 2, Temp/PRES, HEAT EXCH screen
- Press **FILE (Wireless) Button** to enter print menu
- Scroll ▼ **Arrow Button** to select Wireless
- Press ↵ **Button** to print to App

To Disconnect an analyzer

- Select disconnect from Printout screen

Adding Notes & Emailing from the Kane Wireless Printer App

-After a report is on the app, Press the **Pen icon** on the top right of the app screen.

- Press "Write your note here" and you can type your notes for the report. Press **"OK" icon** when done and it will save the note under the report.
- Press the **"3 vertical dots" icon** on the right side of the screen
- From that drop-down menu, Press **"Email" icon**
- Find and select your email app from the list. The email app will open to a new message and your report will be attached

Kane Wireless Printer App Android Personal Details Screen

To print Saved LOGS from Analyzer to App

- Rotate Selector dial to MENU
- Press ▲ **or** ▼ **Arrow Buttons** to select LOGS. Press ↵ **Button**
- In the LOGS screen. Press ↵ **Button** to VIEW.
- Press ▲ **or** ▼ **Arrow Buttons** to select LOGS VIEW you want. Press ↵ **Button**

PRESSURE/TEMPERATURE TESTING

Select the Temperature Rotary Dial position.

Use the T1 connection for the Flue Probe temperature sensor

Use the T2 connection for the Inlet temperature sensor

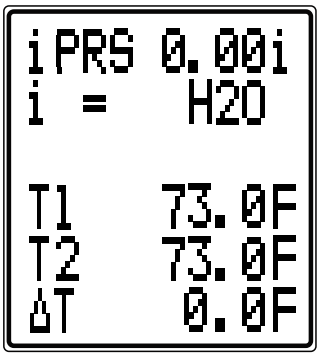
Real time temperature difference

Real time pressure reading

⚠ WARNING

NEVER ATTEMPT TO TAKE A PRESSURE READING WITHOUT KNOWING THE MAXIMUM PRESSURE THAT MIGHT BE PRESENT. THIS INSTRUMENT'S PRESSURE TRANSDUCER IS **RATED AT 1.1 PSI WITH A MAXIMUM OVER RANGE OF 5.8 PSI.**

Select "PRS/TEMP". The pump stops automatically. Using the black connectors and manometer hose, connect to P1 for single pressure or P1 and P2 for differential pressure.



Pressure units can be selected via "MENU".
Eg Flow Temp
Eg Return Temp
Differential Temp

Press to print a full pressure test, (or send to Smart Device via optional Wireless module).

Hold for 2+ seconds to log a pressure report.

PRESSURE MEASUREMENT GOOD PRACTICE

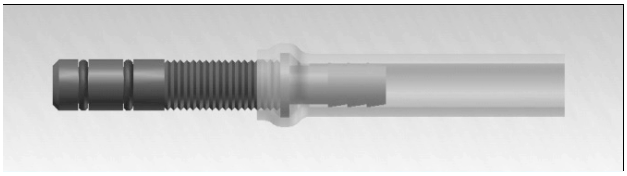
⚠ WARNING

Before using the UEi C165 to measure the pressure of a gas/air ratio valve, read the manufacturer's manual thoroughly. If in doubt, contact the manufactuer.

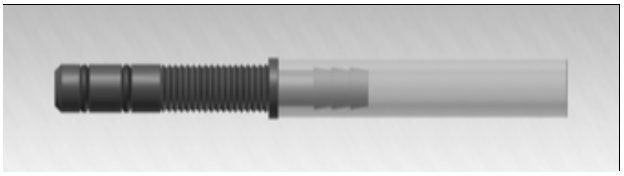
After adjusting a gas/air ratio valve, it is essential the CO, CO_2 are within the manufacturer's specified limits.

LARGE BORE TUBING ISSUES

If using larger bore tubing when performing pressure tests:



☑ Push tubing over the rim of the spigot to ensure a gas tight seal.



☒ This may not produce a gas tight seal.

ANALYZER SPECIFICATIONS

PARAMETER	RANGE	RESOLUTION	ACCURACY
Temp Measurement			
Flue Temperature	32°-1112°F	0.1°F	±3.6°F ±0.3% reading
Inlet Temperature (Internal sensor)	32°-122°F	0.1°F	±3.6°F ±0.3% reading
Inlet Temperature (External sensor)	32°-1112°F	0.1°F	±3.6°F ±0.3% reading
Flue Gas Measurement			
Oxygen*2	0-21%	0.1%	±0.3%
Carbon monoxide*1	0-20ppm 21-2,000ppm Above 2000ppm Purge pump operates	1ppm	±3ppm ±5% reading unspecified
Carbon dioxide*1	0-20%	0.1%	±0.3% volume
Efficiency (Net or Gross)*2	0-99.9%	0.1%	±1.0% reading
Efficiency High (C)*2	0-119.9%	0.1%	±1.0% reading
Excess Air*2	0-250%	0.1%	±0.2% reading
CO/CO_2 ratio*2	0-0.999	0.0001	±5% reading
Nitric Oxide Sensor (optional)	0 to 100ppm Overrange to 1500ppm	1ppm	+ 2ppm <30ppm*1 +5ppm <100ppm*1 +5% reading >100ppm
Pressure (differential)			
Nominal range 32" Maximum over range without damage to sensor is 60"	±0.2 mbar (±0.080 inWC) ±1 mbar (±0.401 inWC) ±80 mbar (±32 inWC)	Maximum 0.001 mbar <25 mbar (0.001 inWC < 10.016)	±0.005 mbar (±0.002 inWC) ±0.03 mbar (±0.080 inWC) ±3% of reading: same
Pre-programmed Fuels	Natural gas, Propane, Butane, LPG, Light Oils (28/35 sec), Wood Pellets, Town Gas, Coke Gas, Bio Oil, Bio Gas		
User programmed Fuels	5 user defined fuels		
Storage Capacity	30 Total Tests		

*1 Using dry gases at STP
*2 Calculated

ANALYZER SPECIFICATIONS CONT.

Carbon Dioxide resolution is 0.01% below 1% measured value.

Ambient Operating Range	32° to 113°F (0° to 45°C) 10% to 90% RH
Storage Temperature Range	0° to 120°F (-18° to 50°C)
Battery Type / Life	3 AA cells >8 hours using Alkaline AA cells
Chargers (optional)	100-240v charger, for NiMH batteries only
Dimensions Weight: Handset: Probe:	 0.8kg handset with protective rubber cover 7.87 x 1.77 x 3.5 in (200 x 45 x 90mm) 11.8 in (300mm) long including handle. 2.3 dia. x 9.4 in (6mm dia. x 240mm) long stainless-steel shaft with 6.5ft (2m) long neoprene hose. Type K thermocouple
CO Protection Pump:	Operates at 2000ppm measured CO.

The C165 is in conformity with the relevant Union harmonization legislation listed below:

Directive	Title
201430EU	Electromagnectic Capability
201165EU	Restriction of use of certain hazardous substances in electrical and electronic equipment (RoHS)

The following harmonized standards and technical specifications have been applied:

CERTIFICATION

The UEi C165 is TUV-tested and certified to EN 50379, Parts 1, 2 & 3 in accordance to 1st German Federal Emission Control Ordinance (BImSchV)
EMC
EN507270:2015
Safety
EN61010-1:2010
RoHS
IEC62321-2:2013, IEC62321-1:2013; IEC62321-3-1;2013, IEC63321-5:2013, IEC623321-4:2013, IEC62321-7-2:2017, IEC62321-7-1:2015, IEC62321-6:2015, AHRI 1260

ELECTROMAGNETIC COMPATIBILITY

European Council Directive 89/336/EEC requires electronic equipment not to generate electromagnetic disturbances exceeding defined levels and have adequate immunity levels for normal operation. Specific standards applicable to this analyzer are stated below.

As there are electrical products in use pre-dating this Directive, they may emit excess electromagnetic radiation levels and, occasionally, it may be appropriate to check the analyzer before use by:

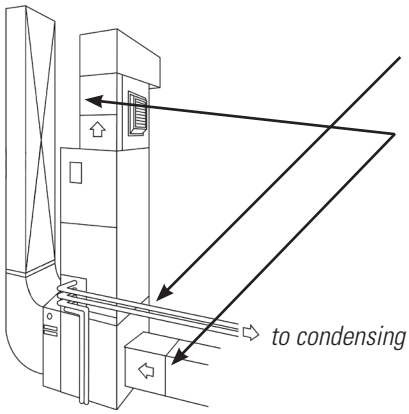
Use the normal start up sequence in the location where the analyzer will be used.
Switch on all localized electrical equipment capable of causing interference.
Check all readings are as expected. A level of disturbance is acceptable.
If not acceptable, adjust the analyzer's position to minimize interference or switch off, if possible, the offending equipment during your test.

At the time of writing this manual (November 2020) UEi Test Instruments is not aware of any field-based situation where such interference has occurred, and this advice is only given to satisfy the requirements of the Directive. This product has been tested for compliance with the following generic standards and is certified to be compliant.

EN 61000-6-3 : 2011
EN 61000-6-1 : 2007

Specification EC/EMC/KI/C165 details the specific test configuration, performance and conditions of use.

Air Conditioning / Heat Pump

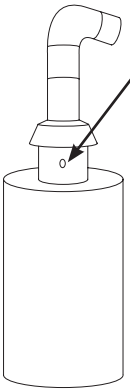


Suction Line:
- Temperature

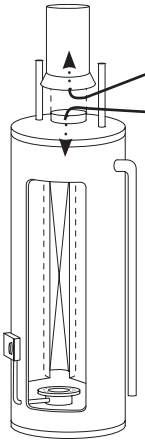
Verify proper:
- Static Duct Pressures
- Temperature Differential
- Static Pressure Drop Across Coils

to condensing unit

Boiler & Water Heaters & High Efficiency Modulating Hot Water Systems



Boiler
Verify proper combustion:
- O_2
- CO_2
- CO Air Free
- Stack Temp
- Stack Draft

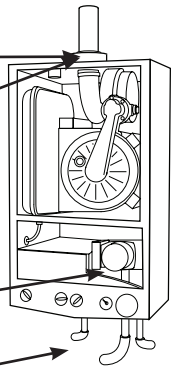


Water Heater
Draft

Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Efficiency

HE Boiler Instant Water Heaters
Draft

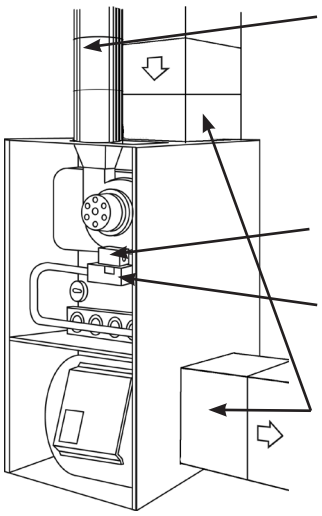
Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Efficiency



Hi / Low fire Gas Pressure

Supply and Return Water temp

Furnaces: 80%



80% Furnace
Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Vent Pressure
- Efficiency

Verify/Set Up
- Gas Pressure

Test
- Limit Switch
- Pressure Switch

Verify proper operation:
- Static Duct Pressure
- Temperature Rise
- AC side Static Pressure Drop across coils

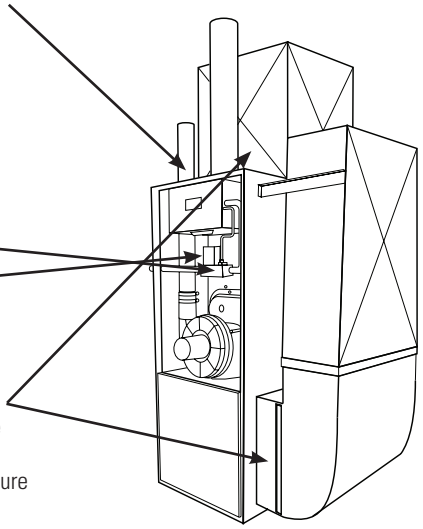
Furnaces: 90%

90%+ Furnace
Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Vent Pressure
- Efficiency

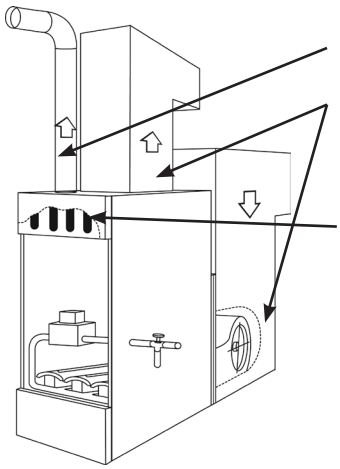
Verify/Set Up
- Gas Pressure

Test
- Limit Switch
- Pressure Switch

Verify proper operation:
- Static Duct Pressure
- Temperature Rise
- AC side Static Pressure Drop across coils



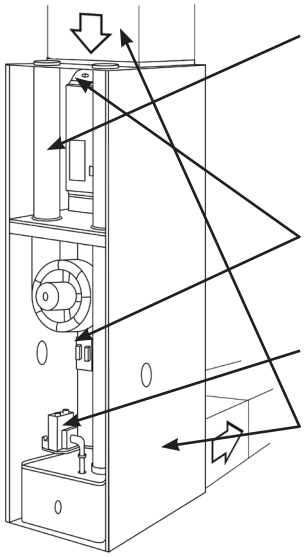
Furnaces (continued): Atmospheric, Gas & Oil



Atmospheric Furnace
Draft

Verify proper
- Temperature Rise
- AC side Static Pressure Drop across coils

Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Efficiency

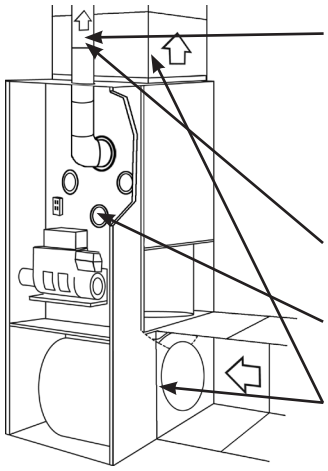


Natural Gas & Propane
Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Vent Pressure
- Efficiency

Test
- Limit Switch
- Pressure Switch

Set Up
- Gas Pressure

Verify proper:
- Static Duct Pressure
- Temperature Rise
- AC side Static Pressure Drop across coils



Oil Furnace
Verify proper combustion:
- O_2
- CO_2
- CO
- Stack Temp
- Stack Draft
- Efficiency

Test & Verify:
- Smoke

Set Up
- Over Fire Draft

Verify proper
- Static Duct Pressure
- Temperature Rise
- AC side Static Pressure Drop across coils

WHAT RESULTS ARE GENERALLY ACCEPTABLE

	Atmospheric Gas Fixed Burners	Gas Fired Burners	Oil Fired burners (#2 Oil Fuel)	Positive Overfire Gas & Oil
Oxygen	7 to 9% O_2	3 to 6% O_2	4 to 7% O_2	3 to 9% O_2
Stack temperature	325˚ to 500˚F	275˚ to 500˚F	325˚ to 600˚F	
Draft (Water Column Inches)	-.02 to -0.4 InWC	-.02 to -0.4 InWC	-.04 to - 0.6 InWC	-.02 to -0.4 InWC
Carbon Monoxide (parts per million)	<100 ppm	<100 ppm	<100 ppm	<100 ppm
Overfire Draft (Water Column Inches)		-.02 InWC	-0.2 InWC	0.4 to 0.6 InWC
Smoke			0 (manufacturer's recommendation)	

NOTE: *Follow manufacturer guidelines for the specific equipment being serviced*

Typical Excess Air Levels

	O2% (measured)	Excess Air %
Natural Gas	3%	16.7%
LIGHT Oil	5%	31%
Coal	8%	62%

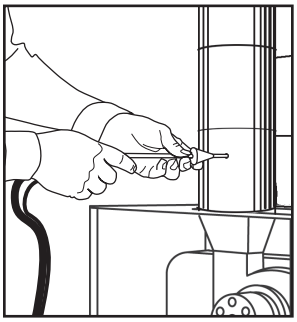
POWERING OFF

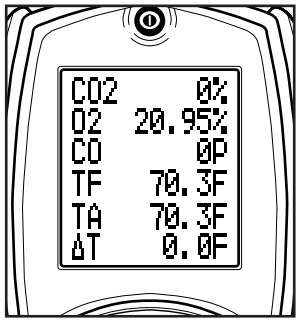
When you power off the C165, there is a 5 second purge when on Flue 1, Flue 2 or AUX screens.

Make sure you do not exceed the analyzer's operating specifications. In particular:
- Do not exceed the flue probes maximum temperature (1112˚F)
- Do not exceed the analyzer's internal temperature range
- Do not put the analyzer on a hot surface
- Do not exceed the water trap's level
- Do not let the particle filter become dirty and blocked

View the displayed data to ensure that the stable operating conditions have been achieved and the readings are within the expected range.

POST TEST





Remove the probe from the flue and allow analyzer to purge with fresh air until readings return to zero. O_2 to 20.9%, CO to Zero (Be careful the probe tip will be HOT).

GENERAL MAINTENANCE

- Re-certify your instrument annually to ensure it meets original performance specification
- Keep your instrument dry, if it gets wet, wipe dry immediately. Liquids can degrade electronic circuits
- Whenever practical, keep the instrument away dust and dirt that cause premature wear
- Although your instrument is built to withstand the rigors of daily use, it can be damaged by severe impacts.
- Use reasonable caution when using and storing this meter

PERIODIC SERVICE

WARNING

Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the instrument. This could alter the protection from personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

COLD WEATHER PRECAUTIONS

It is important you keep your flue gas analyzer in a warm and dry place overnight

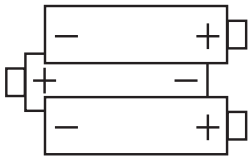
Electronic devices that become really cold, by being left in a vehicle overnight, suffer when taken into a warm room the next morning. Condensation may form which can affect the analyzer's performance & cause permanent damage. See operating and storage temperature specifications.

Electrochemical sensors used in flue gas analyzers can be affected by condensation or water being sucked into the analyzer, as the small apertures on top of sensors can become blocked with water, stopping sensors seeing flue gas. When this happens, oxygen or carbon dioxide reading will display as "—" & sensors may be permanently damaged

If you think that your analyzer is affected by condensation or water ingress, it may be possible to rectify the problem yourself. Simply leave the analyzer running in a warm place, with the pump 'ON' sampling fresh air for a few hours (use mains adapter/battery charger if needed). If, after doing this, you still experience problems please contact our Service Center.

REPLACING THE BATTERIES

This meter has been designed for use with both Alkaline or rechargeable Nickel Metal Hydride (NiMH) batteries. No other types are recommended and will void warranty. The analyzer is supplied with 3 (AA) size NiMH rechargeable batteries. These should be installed into the instrument.



⚠ CAUTION

Take great care when installing the batteries to observe correct polarity. Always check the meter for operation immediately after installing new batteries.

Using Rechargeable Batteries

The battery charger must only be used when NiMH batteries are fitted. Alkaline batteries are not rechargeable. Attempting to recharge alkaline batteries may result in damage to the product and create a fire risk.
When changing the batteries, the time and date will need setting.

⚠ WARNING

Do not try and charge the unit with Alkaline batteries fitted. Do not mix NiMH cells of different capacities from different manufacturers, all cells must be identical.

Turn over the analyzer, remove the protective rubber boot and fit 3 "AA" batteries in the battery compartment. **Take great care to ensure they are fitted with the correct battery polarity.** Replace the battery cover and the protective rubber boot.

Time and Date

When changing the batteries, the time and date will need setting.

Battery Disposal

Always dispose of depleted batteries using approved disposal methods that protect the environment.

Battery Charging

Ensure that you use the correct charger. This unit uses a 5V regulated charger. Ensure the batteries are fitted in the correct manner, and charge for at least 16 hours. Subsequent charges should be overnight. NiMH batteries may be charged at any time, even for short periods to conduct testing.

⚠ WARNING

Under NO circumstances should you expose batteries to extreme heat or fire as they may explode and cause injury. Always dispose of old batteries promptly in a manner consistent with local disposal regulations.

ANNUAL RECERTIFICATION

What You Get

Calibration (or sensor replacement)
30-point inspection by factory trained professionals
Firmware and software updates
Certificate of calibration
Another 12-month warranty on the analyzer
Return unit freight paid – within continental US and Canada
List of work performed, and parts replaced

RECERTIFICATION SERVICES

Turnaround

Before starting any service work, we stabilize your analyzer in ambient air.

Our standard turnaround is 2 working days for standard pre-paid recertification.

If your unit requires extensive diagnostic or repair work, we will contact you with a quotation and estimated repair time prior to starting work.

Pre-authorizing payment for your repair on a credit card saves time. We will ask you for authority to charge the full cost of a service but if we only calibrate your unit, we'll only charge the calibration fee.

Charges will be applied upon completion of the recertification service.

Shipping time for most repairs is 1 to 3 days. UEi pays return freight.

RETURNING YOUR ANALYZER

Before returning your analyzer to UEi Test Instruments, please ensure that you enclose:

- RMA label if you have used our online booking in process or via phone
- Your full contact details
- A daytime telephone number
- Details of faults you might have experienced
- Any relevant accessories (i.e. probe, printer, adapter & leak detectors). Any accessories that are returned will be checked

Packing Your Analyzer

Put analyzer and probes back in their cases

The case should be put into a box with 1-2 inches of packing on each side for protection. When shipping an analyzer only, use a shoe-box size container with enough packing to fill the empty space.

Print out the service paperwork (RMA) sent to you and include it in the packaging.

NOTE: *If you are having specific problems that you want evaluated, please add those comments on the paper work in detail.*

Include any accessories that may be related to issues with the analyzer.

Please be sure no personal items are packed with the return equipment.

You pay to ship your analyzer to us and we'll pay the return freight back to you – within continental US and Canada.

We advise the use of couriers that provide insurance and tracking services.

When we receive your analyzer

Our Service Engineers will inspect the analyzer & accessories. If you haven't booked and paid online, they will contact you to confirm the total recertification cost.

Once accepted, the work will be carried out and on completion, returned to you.

WHERE TO SEND YOUR ANALYZER

USA
UEi Test Instruments
800-547-5740
7601 East 88th Place, Suite 888
Indianapolis, IN 46256

Canada
Kane Canada Measurement Solutions
877-475-0648
150-13571 Verdun Place
Richmond, BC V6V 1W5

OTHER IMPORTANT FACTORS RELATING TO COMBUSTION

The three T's of combustion

- **Time:** Amount of time that the fuel and oxygen are together in the combustion chamber
- **Temperature:** How high the temperature is determines the rate of oxidation, or spread of combustion
- **Turbulence:** How well the fuel and air are mixed

These three factors are all interrelated and will move your results along the combustion curves.

COMBUSTION MEASUREMENT TERMS

Other parameters measured include Net temperature, draft and efficiency.

Net Temperature

Net temperature is the difference between the combustion air entering the combustion chamber and the flue gas temperature past the heat exchange. This is used to determine how efficient the system is extracting heat from the combustion process in addition to the performance of the combustion process. On sealed systems that have ducted inlet air for combustion air, the Net temperature must compare this air stream temperature with the flue gases. If the appliance simply uses room air for the combustion air, our analyzers have an internal temperature sensor in the handset, so it will use this temperature when calculating Net temperature. The most accurate results for efficiency are obtained when measuring flue gases at the point where flue temperature (not flame temperature) is the highest.

Draft

Draft is the difference between the ambient pressure level and the pressure level in the flue.
This is created either by the natural buoyancy of the hot gases created in combustion lifting, or by an inducer fan that assists the flow of flue gases up the stack. Most combustion equipment will specify the amount of draft that is required for proper operation. Draft helps draw combustion air into the combustion chamber, and also helps in mixing the fuel and oxygen. Without proper draft, the combustion process can spill poisonous by-products into the space where the appliance is located. This can be a risk to those in the area, or create a danger to residents or employees working near the combustion equipment.

Efficiency

Efficiency is a measure of how well the fuel is burned to create heat, and how well the generated heat is captured for the intended use. The information used to create this value are based on the fuels heating value, the heat lost up the flue and the gas components in the flue gas. The original method to determine efficiency included many manual methods and lookup charts. As an example you would measure the CO_2 level and the stack temperature and then reference a slide scale that would give you the relative efficiency number. UEi's electronic combustion analyzers perform the measurements on a continuous basis, and can calculate the efficiency as adjustments are being made. Combine this with a printout and you are able to provide a before and after comparison of the combustion equipment in relatively little time as part of normal servicing. **Combustion efficiency is not the same as AFUE (annual fuel usage efficiency). AFUE is not measurable with any portable flue gas analyzer.**

Combustion Efficiency Calculations

This identifies three sources of loss associated with fuel burning:

- Losses due to flue gases:
  Dry Flue gas loss, moisture and hydrogen,
  Sensible heat of water vapor, Unburned gas
- Losses due to refuse:
  Combustible in ash, riddling and dust
- Other losses:
  Radiation, convection, conduction other unmeasured losses

Net efficiency calculations assume that the energy contained in the water vapor (formed as a product of combustion and from wet fuel) is recovered and the wet loss term is zero. Gross efficiency calculations assume that the energy contained in the water vapor is not recovered. Since the fuel air mixture is never consistent there is the possibility of unburned/partially unburned fuel passing through the flue. This is represented by the unburned carbon loss. Losses due to combustible matter in ashes, riddling, dust and grit, radiation, convection and conduction are not included.

CO Air Free

Certain standards (ANSI Z21.1) for Carbon Monoxide are stated in terms of air-free. Air-free refers to the concentration of CO in combustion gases undiluted with flue, or other gases containing little CO. This value is computed using an equation that takes into account the O_2 concentration of the flue gas.

- If 5% O_2 is measured (O_2m) in the flue then the CO gas value will be recalculated as if 0% were measured. The equation for air-free is as follows:: $COaf = CO\ PPM \times [(20.9) / (20.9 - O_2m)]$
- In our example if a reading of 325 PPM were measured then the air-free value would be calculated as follows:
  $COaf = 325\ PPM \times [(20.9) / (20.9 - 5)]$ $COaf = 325\ PPM \times [(20.9) / (15.9)]$ $COaf = 427$

We may be given a limit on our gas range by the local authority, which stated that we must not emit more than 400-PPM Carbon Monoxide air-free. In the example we would be breaking the limit and corrective action should be taken to reduce the level of CO. Air-free values prevent false readings being submitted, e.g. allowing more air into the boiler will increase the oxygen level in the flue and dilute any toxic gas reading. Air-free referencing gives readings as if they were undiluted.

DISPOSAL

Caution: This symbol indicates that equipment and its accessories shall be subject to separate collection and correct disposal.

STORAGE

Remove the batteries when instrument is not in use for a prolonged period of time. Do not expose to high temperatures or humidity. After a period of storage in extreme conditions exceeding the limits mentioned in the General Specifications section, allow the instrument to return to normal operating conditions before using it.

END OF LIFE DISPOSAL

The Waste Electrical or Electronic Equipment (WEEE) Directive requires countries in the EU to maximize collection and environmentally responsible processing of these items. Products are now labelled with a crossed out wheeled bin symbol to remind you that they can be recycled.

Note: Batteries used in this instrument should be disposed of in accordance with current legislation and local guidelines.

WARRANTY

The C165 are warranted to be free from defects in materials and workmanship for a period of 1 year from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge

For more information on warranty and service, contact:

www.ueitest.com Email: info@ueitest.com
1-800-547-5740

This warranty gives you specific legal rights. You may also have other rights, which vary from state to state.