Technical Specification KANE450

Parameter	Resolution	Accuracy	Range
Temp Measurement Flue Temperature	0.1°C/F	±2°C (5°F) ±0.3% reading	0-600°C 32-1112°F
Inlet Temperature (Internal Sensor)	0.1°C/F	±1°C/F ±0.3% reading	0-50°C 32-122°F
Inlet Temperature (External Sensor)	0.1°C/F	±2°C (5°F) ±0.3% reading	0-600°C 32-1112°F
Pressure Measurement Also measures in mbar and other scales	0.1 Pa	±0.5 Pa	± 20 Pa
	0.1 Pa	±3 Pa	± 100 Pa
	1 Pa	± 3% of reading	± 2000 Pa
	0.01 hPa	± 3% of reading	± 80 hPa
Gas Measurement Oxygen	0.1%	±0.2%[*1]	0-21%
Carbon Monoxide (KANE450CO)	1 ppm	±10 ppm <100ppm[*1] ±5% of reading	0-2000 ppm nom 4000 ppm max for 15 minutes
(KANE450COH) Standard in UK	1 ppm	±20 ppm <400 ppm ±5% <5000 ppm ±10% >5000 ppm	0-10,000 ppm
Nitric Oxide (NO) (low range)	1 ppm	±2 ppm < 30 ppm[*1] ±5 ppm > 30 ppm	0-100 ppm
Carbon Dioxide[*2] Efficiency[*2] Excess Air[*2]	0.1% 0.1% 0.1%	±0.3% reading ±1.0% reading ±0.2%	0-30% 0-99.9% 0-250%
Pre-programmed Fuels	Natural gas, Light Oil, Propane, Butane, LPG.		
Dimensions Weight Handset Probe	0.77kg / 2.2lb handset with boot 200 x 45 x 90mm (7.9" x 1.8" x 3.5") L300mm (11.8") x Dia 6mm (0.25") with 200mm (7.8") long stainless steel shaft, type K thermocouple and 3m (6') long neoprene hose		
Ambient Operating Range	+0°C to +40°C / 32-104°F 10% to 90% RH non- condensing		
Storage Capacity LOG **REPORT**	255 sets of test results in volatile memory 8 sets of each report in volatile memory		
Battery Type / Life	4 AA cells >12 hours using Alkaline AA cells		
Chargers (optional)	220v fast charger, for NiMH batteries only 12v in vehicle charger, for NiMH batteries only		

[*1] Using dry gases at STP   [*2]   Calculated

Using The Menu

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

△	= Scroll up	▽	= Scroll down	↵	= Enter

Main Menu	Sub Menu	Options / Comments
SETUP	SET FUEL	NAT GAS, L OIL, PROPANE, BUTANE, LPG
	N ← C → G	Select the combustion efficiency calculation required ~ N = nett eff, G = gross eff, C = for condensing boilers
	SET TIME	Uses "Military" time. 7am = 07:00, 7pm = 19:00
	SET DATE	DD-MM-YY, MM-DD-YY
	C ← → F	°C, °F
	PPM ← → MG	PPM, MG/M³
	O2 REF	NO, YES
	LANGUAGE	Various Languages
PRESSURE	SMOOTH	OFF = fast response. ON = slow response
	RESOLVE	HIGH, LOW, selects the number of decimal places
	PS UNITS	mBar, mmH₂O, Pa, kPa, PSI, mmHg, hPa, InH₂O
STORE	VIEW	View logged readings
	AUTO STO	See KANE450 REPORTS page
	DEL ALL	NO, YES
REPORT		See KANE450 REPORTS page
SCREEN	CONTRAST	Factory setting is 04
	AUX	User selectable parameters
	HEADER	Sets printout header, 2 lines, 20 characters per line

Your distributor

Ref: KA450IT06

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Hand Held Gas Analyser

KANE450

it's easy with Kane

450

O2
CO
NO
CO2
CO/CO2 Ratio
Temp
Pressure

Optional Extras

- **Gas leak detector**
- **0-10,000 ppm CO sensor sensor with H₂ compensation - standard in UK**
- **0-5000 ppm or 0-100ppm NO sensor**
- **2 psi ± 160 mbar pressure sensor**
- **Bluetooth™ data transfer**
- **KMIRP infra-red thermal paper printer**
- **KANE ImPrint infra-red plain paper printer**
- **NiMH rechargeable batteries**
- **220v fast charger**
- **12v in-vehicle charger**

TEST	11	
DATE		13/04/06
TIME		12:21:35
FUEL		NATU GAS
O2	%	9.3
CO2	%	6.6
CO	ppm	21
FLUE	°C	148.6
INLT	°C	-0C-
NETT	°C	125.8
EFF	(N)	92.5
PRS	mBAR	0.001
LOSSES	%	7.5
XAIR	%	80.1
CO/CO2		0.003

Features

- **Four line backlit display controlled by rotary switch**
- **Protective rubber sleeve with integral magnet for "hands free" use**
- **O₂, CO, CO₂, CO/CO₂ ratio, temperature and efficiency readings**
- **Multi-fuel (natural gas, propane, butane, LPG, 28/35 sec oils)**
- **High accuracy differential manometer with resolution to 0.001 mbar with range to ± 80 mbar**
- **Differential thermometer for flow / return / ∆T**
- **Hold, store and auto-store readings**
- **Reports include combustion test, tightness test, CO build-up and differential temperature**
- **Infra-red output to optional printer**
- **Torch light and backlit display**
- **Designed to meet BS7927, BS7967 and BS EN50379**
- **5 year extended warranty if serviced annually by Kane**

KANE450 Boiler Analyser takes the pressure

Infra-red printer emitter

Infra-red printer emitter and torch light

KANE450 Kit

The NEW KANE450 has all the features of a "top of the range" combustion analyser and is controlled by an "easy to use" rotary switch similar to the popular KANE250. Any four parameters can be viewed on the large backlit display. To change a parameter simply select the new one on the dial and press the enter button!

It performs all combustion, pressure, temperatures and CO tests necessary to commission and service condensing and high efficiency boilers. A gas leak detector wand option is also available. Live tests, stored tests or full reports can be printed using an infra-red printer or sent to a laptop or PDA via a Bluetooth™ option.

An outstanding feature of the KANE450 is the high accuracy and stability of its pressure readings. Difficult tasks like measuring flue draught or setting the differential pressure of air/fuel ratio valves can be performed with confidence. At low pressures it displays to 0.001 mbar and is accurate to ±0.005 mbar - significantly better than any standard electronic manometer! The excellent stability of readings is particularly important when the analyser performs an automatic "tightness test" sequence.

Battery life is typically 12 hours when fitted with either alkaline or rechargeable NiMH batteries. A 12v in vehicle charger option is available.

Line select LED's

Menu controls ~ Scroll up/down Enter

Function buttons x4 (See button guide for details)

Rotary switch

Particle filter

Water trap

"Battery charging" indicator

Analyser connections (See picture below)

Flue gas inlet

Battery charger connection

Temperature connections ~ Flue probe temperature (T1) Inlet temperature (T2)

Pressure connections ~ P1 P2 (differential)

Flue gas inlet

Water trap drain with rubber plug

Button guide

ON / OFF
Turns the analyser ON / OFF.

PUMP / CAL PRESSURE
Turns the pump ON / OFF. Press for 2+ seconds to zero the pressure sensor.

PRINT / BACKLIGHT
Press to print "live" or "frozen" data. Press again to abort. Press for 2+ seconds to switch backlight & torch ON / OFF.

LINE SELECT / FREEZE
Press to select active line on display as indicated by LED's. Press for 2 seconds to "HOLD". Press longer to "LOG".

KANE450 Features and Benefits

Feature	Benefit
Rotary switch	Quick and easy to use
Large display with backlight	Clear and easy to read
4 line display	Any four parameters can be selected and displayed using the rotary switch
Multifuel	Test any boiler using Natural Gas, Light Oil, Propane, Butane, LPG
Efficiency calculations include Nett, Gross and Condensing	Suitable for all boilers including condensing
High accuracy pressure sensor with quick zero function and fast/slow response settings.	Ideal for flue draught tests, let-by tests, tightness tests and checking air/gas ratio valves as it measures differential pressure to 0.001 mbar resolution.
Measures differential temperature	Accurately checks flow, return and differential temperatures simultaneously
"Quick start" feature for temperature and pressure readings	Saves time when you don't need flue gas analysis
Infra-red output to printers	Thermal or impact printer available. Printout includes two line header, date/time.
Instant one button printout	Quick and easy to print test results
Instant one button logging	Quick and easy to log test results
Reports feature	Combustion logging Tightness Test – complies with IGE/UP/1B CO room build up – complies with BS7967 Temperature report – ideal for Benchmark
Optional Bluetooth upgrade	Download results direct to a PC or PDA
4 x AA alkaline batteries	Battery life typically more than 12+ hours
NiMH rechargeable battery option	12 v "in car" charger. No more flat batteries!
Rubber boot with integral magnet	Provides extra protection and "hands free" operation
Task light	Never got a torch when you need one? You have now!
Optional H compensated CO sensor	Increased CO range, 0-10,000ppm - fitted as standard in UK
Optional NO upgrade	Includes low range 0-100ppm
Optional Leak Detector	Easy to detect gas leaks
Low running costs	As standard!
Low service costs + "Free" 12-month rolling warranty	Equivalent to a 5 year warranty if returned annually to Kane. (See UK service price list or www.kane.co.uk for full details)

KANE450 Reports

AUTO STORE ~ (stores up to 255 tests)
From the menu select STORE, AUTO STORE, YES.
Set the time interval (in seconds) between logs. The analyser starts logging as soon as you exit the menu and stops when you select STORE, AUTO STORE, NO.

To view the results select STORE, VIEW, then enter the log number required. Use the rotary dial and line selector to view the readings as normal. Use scroll up/down to view other log numbers.

To delete select DEL ALL, YES

```
TEST            11
DATE      03/08/05
TIME      16:27:32

FUEL     NATU GAS

O2    %       9.3
CO2   %       6.6
CO    ppm      21
FLUE  °C    148.6
INLT  °C     -OC-
NETT  °C    125.8

EFF   (N)    92.5
PRS  mBAR   0.001
LOSSES %      7.5
XAIR  %      80.1

CO/CO2      0.003

              etc.
```

PRESSURE ~ (stores up to 8 tests)
From the menu select REPORT, PRESSURE, TEST.

Press the "Pump" key to zero the pressure sensor.

CONNECT the pressure hose to pressure connection P1.
Press "Enter" to start the 1 minute stabilization period.
Press "Enter" again to start the 2 minute tightness test.

To view the results select REPORT, PRESSURE, VIEW.
Use scroll up/down to view other log numbers.

To exit press "Enter". To delete select DEL ALL, YES

```
TIGHTNESS TEST

LOG    05
TIME 15:40    03/08/05

PRS_1 mBAR    20.110
PRS_2 mBAR    19.998
DURATION MINS    3:00
Customer

Appliance
                etc.
```

TEMPERATURE ~ (stores up to 8 tests)
From the menu select REPORT, TEMP, TEST.
CONNECT the thermocouples, "flow" to T1, "return" to T2.
Press "Enter" once to view readings and once more to log.

To view the results select REPORT, TEMP, VIEW. Use scroll up/down to view other log numbers.

To exit press "Enter". To delete select DEL ALL, YES

```
TEMP TEST

LOG    02
TIME 16:37    03/08/05

FLOW   °C      48.3
RETURN °C      39.7
NETT   °C       8.6
                etc.
```

ROOM CO ~ (stores up to 8 tests)
From the menu select REPORT, ROOM CO, TEST.
The pump will run and the analyser will log the CO reading every minute for 15 minutes.

To view the results select REPORT, ROOM CO, VIEW.
Use scroll up/down to view other log numbers.
Use "Enter" to view each reading within the ROOM CO TEST

To exit use rotary switch.
To delete select DEL ALL, YES

```
ROOM CO TEST

LOG    01
TIME 09:20    04/08/05

TEST       CO ppm
 0           00
 1           02

14           02
15           01
MAXIMUM CO   02
                etc.
```