

PORTABLE FLUE GAS ANALYZER

TEMPEST 50

FEATURES

- Measures Carbon Monoxide and Oxygen
- Calculation of Carbon Dioxide, Boiler CO/CO2 Ratio and Efficiency Reading
- Selectable Fuel Types
- Gross or Net Efficiency Selection
- Optional NO sensor
- Robust design & Splash Proof
- Easy to use Menu
- Back Lit Display
- High Quality Stainless Steel Probe
- Soft Carry Case
- Positive & Negative Pressure with Differential Measurement
- Pressure Measurement Zero Facility
- User Selectable Scales
- Differential Temperature Measurement with Two Thermocouples
- Outlet, Net and Inlet Temperature Displays
- Logging of 100 Flue Gas Analysis Reports
- Built-in Printer
- Factory Set Personalized Report Heading
- Real Time Clock
- Data Output to Printer or PC



Tempest 50 is the fast and economical way to measure the composition of boiler flue emissions, thus reducing the need for boiler strip-down when the appliance is working safely and efficiently.

Tempest 50 is rugged, portable and flexible, this flue gas analyzer will operate direct from the mains or from the onboard rechargeable battery.



CEA Instruments, Inc.

"EXPERTS IN TOXIC GAS DETECTION"

TEMPEST 50 SPECIFICATIONS

<u>Instrument</u>	Operating Temperature Range -5 °C to 50 °C (23 °F to 122 °F) Battery Rechargeable Ni-Cd – Life 4-5 hours Charger Input Voltage 115V or 230V; 50/60Hz AC Fuels Natural gas, light oil, heavy oil, propane, butane, coal, coke Display 4 lines, 20 characters per line. Backlit LCD Header Factory set Data Logging 100 set of readings Time and Date 24 hour real time clock Dimensions 280 x 120 x 112 mm (11" x 4.7" x 4.4") Weight 1.3 Kg (2.86 lbs) Certification Designed to meet BS7927 British Standard for portable flue gas analyzers Options NO sensor Pressure (gas flue differential)
--------------------------	--

<u>Probe</u>	Construction Pistol grip; 250 mm probe length; 2500 mm (10') hose length K-type Thermocouple Accuracy +/- 0.3%; +/- 1 °C (+/- 1.8 °F) Maximum Temperature 800 °C (1,472 °F) Options High temperature to 1,100 °C (2,012 °F), 1 m insertion length
---------------------	--

<u>Gases</u>	Range	Resolution	Accuracy
Oxygen	0 - 25%	0.1%	+/- 0.3%
Carbon Monoxide	0 - 10,000 ppm	+/- 1 ppm	<100 ppm; +/- 5 ppm >100 ppm; +/- 5%
NO (optional)	0 - 1,000 ppm	+/- 1 ppm	<100 ppm; +/- 5%
CO2 (calculated)	0 - 25%		
CO/CO2 Ratio	0 - 0.9999		
Combustion Efficiency	0 - 100%		

<u>Draught/Pressure Measurement</u>	Range +/- 150 mbar (+/-61 inWG) Resolution 0.01 mbar (0.4 inWG) Accuracy +/- 0.5% fsd
--	--

<u>Integrated Printer</u>	Type Impact with replaceable ribbon Print Width 16 characters, 45 mm
----------------------------------	---

(Specifications subject to change without notice.)



CEA Instruments, Inc.

160 Tillman Street, Westwood, N.J. 07675 U.S.A.
 Telephone (201) 967-5660 Fax (201) 967-8450
 E-Mail: ceainstr@aol.com Website: www.ceainstr.com

PORTABLE FLUE GAS ANALYZER

TEMPEST 100

FEATURES

- Measures Carbon Monoxide, Oxygen and Nitric Oxide
- Option of Nitrogen Dioxide, Sulfur Dioxide, Hydrogen Sulfide and Hydrogen Chloride Sensors (Up to Three)
- Calculates Carbon Dioxide and Nitrous Oxides
- Calculates CO/CO₂ Ratio and Efficiency Reading
- Selectable Fuel Types
- Gross or Net Efficiency Selection
- Optional High Capacity (100,000 ppm) Carbon Monoxide Sensor Instead of Standard Range
- Robust design & Splash Proof
- Easy to use Menu and Back Lit Display
- High Quality Stainless Steel Probe
- Soft Carry Case
- Positive & Negative Pressure with Differential Measurement
- Pressure Measurement Zero Facility
- mbar & inWG options
- User Selectable Scales
- Differential Temperature Measurement with Two Thermocouples
- Outlet, Net and Inlet Temperature Displays
- Both Centigrade and Fahrenheit measurements
- Logging of 75 Flue Gas Analysis Reports
- Automatic Periodical Analysis Measurement
- Built-in Fade Resistant Printer
- Factory Set Personalized Report Heading
- RS232 and Parallel Data Ports
- Real Time Clock



Tempest 100 is one of the most powerful portable combustion analysers you can buy. The combination of multigas emission analysis, differential pressure and temperature measurement reduces service costs and ensures the safe operation of appliances.

Tempest 100 is rugged, portable, reliable and flexible. By choosing up to six (6) out of a choice of seven (7) gas sensors, it can be configured to meet specific monitoring requirements. Data logging can be enabled for remote analysis of emissions, with user configurable time periods.



CEA Instruments, Inc.

"EXPERTS IN TOXIC GAS DETECTION"

TEMPEST 100 SPECIFICATIONS

Instrument

Operating Temperature Range	-5°C to 50°C (23°F to 122°F)
Battery	Rechargeable Ni-Cd. Life 4-5 hours, charge time 2 hours
Charger Input Voltage	115V or 230V; 50/60Hz AC
Fuels	Natural gas, light oil, heavy oil, propane, butane, coal, coke
Display	Backlit LCD, 4 lines, 20 characters per line.
Data Logging / Printing	User configurable, 75 set of readings, through RS232 or parallel port
Time and Date	24 hour real time clock
Dimensions	280 x 120 x 112 mm (11" x 4.7" x 4.4")
Weight	1.3 Kg (2.86 lbs)
Printer	Impact with a replaceable ribbon. 16 characters per line, 45 mm (1.8") paper
Certification	Designed to meet BS7927 British Standard for portable flue gas analyzers
Options	User defined header, user defined fuel, aluminum case, stack loss calculation, surface / air temperature probe

Probes

Construction	Pistol grip; 250 mm (10") stainless steel probe length; depth gauge; 2500 mm (10') hose length
K-type Thermocouple	Accuracy +/- 0.3%; +/- 1°C (+/- 1.8°F)
Maximum Temperature	800°C (1,472°F)
Options	High temperature to 1,100°C (2,012°F), 1m insertion length

Gases

	Range	Resolution	Accuracy
Oxygen	0 - 25%	0.1%	+/- 0.3%
Carbon Monoxide	0 - 10,000 ppm	+/- 1 ppm	<100 ppm; +/- 5 ppm >100 ppm; +/- 5%
Nitric Oxide	0 - 1,000 ppm	+/- 1 ppm	<100 ppm; +/- 5 ppm >100 ppm; +/- 5%
Carbon Dioxide (Calculated)	0 - 25%		
CO/CO2 Ratio	0 - 0.9999		
Combustion Efficiency	0 - 100%		

Optional Sensors

	Range	Resolution	Accuracy
Nitrogen Dioxide	0 - 200 ppm	+/- 1 ppm	<20 ppm; +/- 2 ppm >20 ppm; +/- 5%
Sulfur Dioxide	0 - 2,000 ppm	+/- 1 ppm	<100 ppm; +/- 5 ppm >100 ppm; +/- 5%
Hydrogen Sulfide	0 - 200 ppm	+/- 1 ppm	<40 ppm; +/- 2 ppm >40 ppm; +/- 5%
Hydrogen Chloride	0 - 50 ppm	+/- 1 ppm	<40 ppm; +/- 5 ppm >40 ppm; +/- 5%
High Capacity Carbon Monoxide (Instead of Standard)	0 - 100,000 ppm	+/- 1 ppm	<100 ppm; +/- 5 ppm >100 ppm; +/- 5%

Draught / Pressure

Measurement Range	+/- 150 mbar (+/-61 inWG)
Resolution	0.01 mbar (0.4 inWG)
Accuracy	+/- 0.5% fsd measured at 50 mbar (20 inWG)
K-Type Thermocouple	Accuracy +/- 0.3%; +/- 1°C (+/- 33°F)

(Specifications subject to change without notice.)



CEA Instruments, Inc.

160 Tillman Street, Westwood, N.J. 07675 U.S.A.
 Telephone (201) 967-5660 Fax (201) 967-8450
 E-Mail: ceainstr@aol.com Website: www.ceainstr.com



CEA Instruments, Inc.

160 Tillman Street

Westwood, N.J. 07675 USA

Phone (201) 967-5660 Fax (201) 967-8450

Website: www.ceainstr.com E-mail: ceainstr@aol.com

TEMPEST 50 & TEMPEST 100 PRICE LIST

	Part Number	Price
Tempest 50	99F20003	\$ 1,500.00

Combustion / Flue Gas Analyzer

- Combustion analyzer (Ratio, efficiency, XSAir, Oxygen, calculated CO₂)
- Optional (see below) Differential Manometer (pressure)
- Differential temperature measurement
- Carbon Monoxide detector
- Optional (see below) Nitric Oxide (NO) detector

Complete with stainless steel flue probe, data logging, built-in printer, carry case, charger, rechargeable battery and instruction book. Conforms to BS7927

As 99F20003 with pressure sensing & draught measurement +/- 150 mBar	99F20004	\$ 1,750.00
--	-----------------	--------------------

As 99F20004 with Nitric Oxide (NO) sensor, 0-1000 ppm	99F20006	\$ 2,150.00
---	-----------------	--------------------

Tempest 100	99F21005 (USA Plug)	\$ 3,376.00
	99F21001 (UK Plug)	\$ 3,296.00

Combustion Gas Analyzer

- Combustion analyzer (Ratio, efficiency, XSAir, Oxygen, calculated CO₂)
- Differential Manometer (pressure)
- Differential temperature measurement
- Carbon Monoxide (CO) detector
- Nitric Oxide (NO) sensor for NO_x measurement
- Optional NO₂, SO₂, H₂S, HCl and high range 0-100,000 ppm CO sensors

Complete with stainless steel flue probe, data logging (75 sets), built-in printer, carry case, charger, rechargeable battery and instruction book. Conforms to BS7927

As 99F21005 with NO ₂ sensor	99F21002	\$ 3,836.00
---	-----------------	--------------------

As 99F21005 with SO ₂ sensor	99F21003	\$ 3,836.00
---	-----------------	--------------------

As 99F21005 with NO ₂ and SO ₂ sensor	99F21004	\$ 4,544.00
---	-----------------	--------------------

Tempest 50 or Tempest 100 Country Specific Version for **USA, France, Turkey, Italy, Brazil & Belgium**. Changes include languages and gas modifications to suit local requirements, as well as country specific charger. (Specify) **\$ 121.00**

(OVER)



CEA Instruments, Inc.

160 Tillman Street

Westwood, N.J. 07675 USA

Phone (201) 967-5660 Fax (201) 967-8450

Website: www.ceainstr.com E-mail: ceainstr@aol.com

Options on Tempest 50 New Builds

	Part Number	Price
Personalized header	OPT20040	\$ 118.00
Carbon Monoxide (CO) sensor - 0% to 10% (100,000 ppm)	OPT20039	\$ 306.00
1 Meter probe	PRB20062	\$ 388.00
High temperature probe (max. 1100°C)	PRB20061	\$ 640.00
Aluminum carrying case	CAS20014	\$ 115.00
Smoke tester kit – True Spot	MIS20001	\$ 234.00

Options on Tempest 100 New Builds

	Part Number	Price
Car Charger Lead	CHG99002	\$ 34.00
Hydrogen Sulfide (H ₂ S)	OPT21001	\$ 768.00
Carbon Monoxide (CO) sensor - 0% to 10% (100,000 ppm)	OPT20039	\$ 306.00
Calculation of Stack Losses	OPT20050	\$ 102.00
User-defined Fuel (non-standard)	OPT20041	\$ 114.00
1 Meter probe	PRB20062	\$ 388.00
1 Meter probe with PTFE tubing (HCl sensor fitted)	PRB20070	\$ 1,010.00
1 Meter probe High Temperature Version of PRB20070	PRB20071	\$ 1,480.00
1 Meter probe with Viton tubing (NO ₂ sensor fitted)	PRB20072	\$ 578.00
1 Meter probe High Temperature Version of PRB20072	PRB20073	\$ 922.00
2 Meter extension lead w/ Viton tubing for units with NO ₂	TUB20084	\$ 126.00
4 Meter extension lead w/ Viton tubing for units with NO ₂	TUB20085	\$ 344.00
Probe High Temperature (max. 1100°C)	PRB20061	\$ 656.00
Aluminum Case	CAS20014	\$ 115.00
Smoke tester kit – True Spot	MIS20001	\$ 234.00

Tempest Spare Sensors (Supply Only)

	Part Number	Price
Oxygen (O ₂) Sensor	SEN20076	\$ 165.00
Carbon Monoxide (CO) Sensor	SEN20075	\$ 216.00
Carbon Monoxide (CO) Sensor – H ₂ Compensated	SEN20079	\$ 252.00
Nitric Oxide (NO) Sensor	SEN20077	\$ 340.00
Nitrogen Dioxide (NO ₂) Sensor	SEN20071	\$ 432.00
Sulfur Dioxide (SO ₂) Sensor	SEN20069	\$ 432.00
Hydrogen Sulfide (H ₂ S) Sensor	SEN99016	\$ 516.00
Hydrogen Chloride (HCl) Sensor	SEN99017	\$ 640.00
Pressure sensor	SEN20070	\$ 104.00



CEA Instruments, Inc.

160 Tillman Street

Westwood, N.J. 07675 USA

Phone (201) 967-5660 Fax (201) 967-8450

Website: www.ceainstr.com E-mail: ceainstr@aol.com

Tempest 50 and Tempest 100 Common Spares	Part Number	Price
Standard 250 mm Probe with thermocouple (max. 800°C)	PRB26001	\$ 236.00
1 Meter probe	PRB20062	\$ 388.00
High Temperature Probe (max. 1100°C)	PRB20061	\$ 640.00
Flexible probe extension lead - 2 Meters	TUB20082	\$ 86.00
Flexible probe extension lead - 4 Meters	TUB20083	\$ 172.00
Soft Carrying Case	CAS20013	\$ 74.00
Rechargeable Battery Pack	BAT20005	\$ 66.00
Battery Charger – UK Version	CHG99007	\$ 80.00
Battery Charger – US Version	CHG99007	\$ 80.00
Battery Charger – EU Version	CHG99007	\$ 80.00
Car Charger Lead	CHG99002	\$ 33.00
Filter Bowl	MOL20037	\$ 17.00
Filter Bowl Sealing 'O' Ring (set of 5)	ORG20052	\$ 15.00
Filter Bowl Inner Disc (set of 5)	MOL20034	\$ 35.00
Filter Bowl Inner Disc Gasket (set of 5)	GAS99005	\$ 35.00
Filter Bowl Drain Plug (set of 5)	PLG20059	\$ 15.00
Coalescing Filter Element (set of 5)	FIL20021	\$ 60.00
Particulate Filter Element (set of 5)	FIL20019	\$ 45.00
SOx / NOx Filter	FIL99010	\$ 24.00
Intermediate Gasket	GAS20025	\$ 3.00
Printer Door Hinge	MOL20036	\$ 8.00
Printer Paper Roll (set of 20)	PAP20053	\$ 80.00
Printer Ribbon	RIB20068	\$ 22.00
6 Volt Electric Pump	PMP99001	\$ 134.00
Smoke Tester Color Chart	CHT99001	\$ 46.00
Tempest RS232 output lead – 1.5 Meters	CAB20011	\$ 80.00
Smoke Tester Filter Paper	FIL99003	\$ 76.00