RC612

Carbon and Water Determinator

Specification Sheet

Instrument Range* **(250 mg for %; 7.2 in² strip sample for area)**		
% Carbon: **Area Carbon:** **% Water:**	50 ppm to 20 % 0.002 mg/in to 6.94 mg/in2 100 ppm to 20 %	
Precision	Carbon: 25 ppm or 3 % RSD of result; whichever is greater H2O: 50 ppm or 3 % RSD of result; whichever is greater	
Calibration	Standards	
Detection Method	Solid-state infrared	
Sample Size	Powdered: 0.5 g, nominal Non-Powdered: Strip or tubular samples up to 0.9 in × 4 in (23 mm × 102 mm)	
Chemical Reagents	Sodium Hydroxide on Inert Base Copper Oxide	Anhydrous Magnesium Perchlorate
Gases (Carrier)	Oxygen, 99.5 % pure, 40 psi (2.8 bar) ±10 %	Nitrogen, 99.5 % pure, 40 psi (2.8 bar) ±10 %
Gas Flows	Oxygen: 3 L/min when in use	Nitrogen: 3 L/min when in use
Furnace Range	Resistance Heated; near-ambient to 1,100 °C (2,012 °F); Programmable setpoints and ramp rates	
Environmental Conditions	Operating Temperature: 15 °C to 35 °C (59 °F to 95 °F) Relative Humidity: 20 % to 80 %, non-condensing	
Sound Pressure Level	63 dBa (max reading at operator's level per IEC/EN 61010-1)	
Electrical Power Requirements	230 V~, 50/60 Hz, single phase, 30 A; 23,600 Btu/h	
Physical Dimensions**	33 in H × 22.5 in W × 34.5 in D (84 cm × 57 cm × 87 cm)	
Weight (Approx.)	231 lb (105 kg)	
Shipping Weight (Approx.)	282 lb (128 kg)	

Part Numbers

RC612C	RC612 Determinator with software and external PC
RC612LC	RC612 Determinator with software, external PC, and 50-sample Autoloader

Options

620-400-210	Autoloader Add-On Kit
633-103-356	O2 Regulator
633-103-358	Inert Regulator
751-350-110	L-250 Balance
619-995	Bar Code Reader (USB)

* *Range may be affected by reducing or increasing sample mass; specified range based upon LECO standard materials and methods; range is matrix dependent.*

** *Allow a 6 in (15 cm) minimum access area around all units.*

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Theory of Operation

The RC612 multiphase carbon and hydrogen/moisture determinator quantifies the carbon and water present in various organic and inorganic samples, and identifies the source of several types of carbon content.

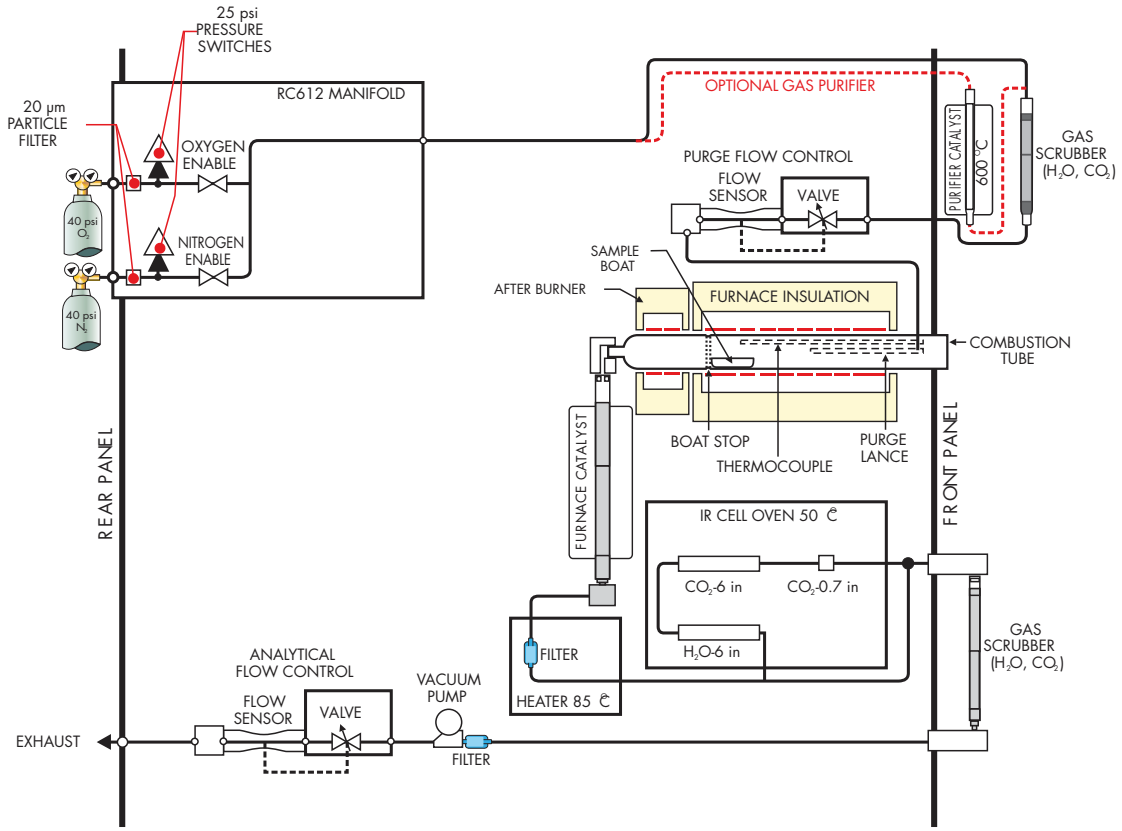
The RC612 features a state-of-the-art furnace control system, which allows the temperature of the dual-stage furnace to be programmed from near-ambient to 1,100 °C.

Depending on the application, multiple furnace steps can be programmed by the operator and the furnace purged with oxygen or nitrogen, creating oxidizing or inert conditions in which the carbon and water present is combusted or reacted. An afterburner furnace (nominally set to 850 °C) and a secondary oxidation catalyst are included in the flow path to ensure full combustion/reaction of all evolved components. Infrared detection is used to quantify the result either as a weight percentage or as a coating weight (mg/in^2).

When combusted in an oxidizing atmosphere (O_2), all forms of carbon (except some carbides such as SiC) are converted to CO_2. In contrast, organic forms of carbon produce both H_2O and CO_2. Thus the presence of organic carbon may be verified by finding coincident peaks in H_2O and CO_2. Water and carbonate are detected when the sample is combusted in an inert (N_2) atmosphere, with the furnace catalyst temperatures at 120 °C. In this mode, organic carbon is normally not detected. Additional sources of carbon can often be differentiated by the temperature at which they oxidize or volatilize.

A slow ramping temperature program, from 100 °C to 1,000 °C at 20 °C/min, can be used for the analysis of unknown samples. This type of analysis can be used to indicate the temperatures at which the differing forms of carbon are oxidized, thereby enabling the operator to optimize the furnace temperature program to provide more rapid quantitative results for each form of carbon present in this sample type.

Flow Diagram



Specifications and part numbers may change.
Consult LECO for latest information.
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