Lenox Instrument Company, Inc.
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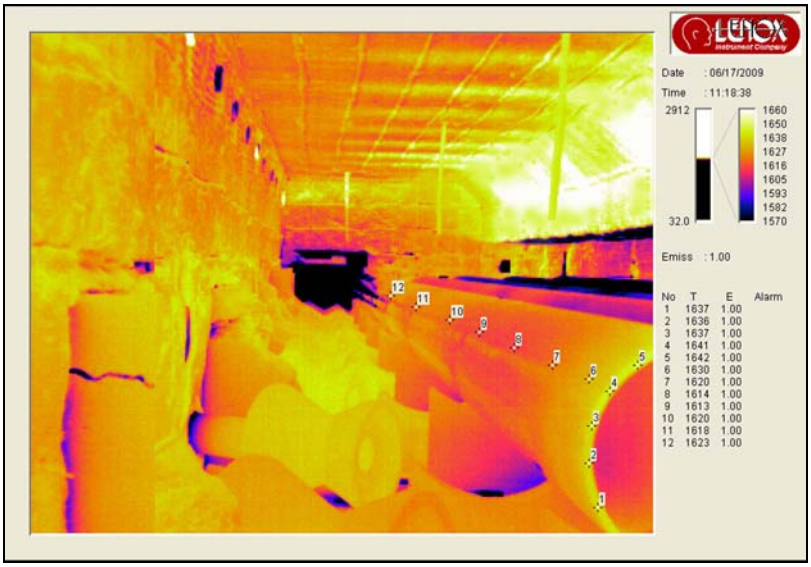
Thermal Imaging Thru-Wall System for High-Temperature Furnaces

Real-Time, Accurate, Near-Infrared (NIR) Temperature Measurement



Lenox Furnace Camera HD NIR-Thermal Imaging Systems provide real-time, accurate, non-contact temperature measurement and monitoring from 324,064 individual temperature points via a high speed digital connection. Designed to be installed through a small, 3-1/2 inch (89mm) opening in the wall of a furnace or combustion chamber, the high resolution, infrared camera employs a stainless steel housing with a steel triple wall laminar flow for efficient water-cooling of the camera and integrated low consumption air-purging that keeps the lens clear of particulate, enabling operation in hostile environments up to 4250ºF (2245ºC). The Lenox near-infrared (NIR) camera's specially selected short wavelength minimizes temperature measurement errors due to variations in target surface emissivity. An Automatic Retract System is available that pulls the thermal imaging camera back should a loss of water-cooling or air occur, preventing possible over-temperature damage.

Lenox Image Processing Software allows high resolution images and data to be viewed, manipulated, recorded and archived and to remotely control the camera. Advanced image processing and digital communications include features and benefits like:

- **Accurate and real time temperature measurement, recording and analysis**
- **Analytical and process control functions e.g. multiple point or user-defined areas of interest temperature measurement, multiple temperature line profiles, isotherms, histograms, trending, emissivity adjustment, delta temperature measurement, background correction and choice of color pallets**
- **Automatic storage of images and video on triggered measurement or high/low alarm conditions**
- **Optional RS485 Input/Output (I/O) modules for software integration to a PLC or DCS**
- **Analyze stored data offline**
- **Information exchange via TCP/IP protocol**

Lenox NIR-Thermal Imaging Camera System applications include steel annealing and reheat furnaces, glass furnaces, cement kilns, black liquor boilers, power utility boilers (superheater inspection - slag buildup), and other high temperature furnace, kiln, and oven environments.

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Furnace Camera HD Thermal Imager System Specifications

Temperature Measurement Range	1112 to 1832°F (600 to 1000°C) 1472 to 2552°F (800 to 1400°C) 1832 to 3272°F (1000 to 1800°C) 2552 to 4250°F (1400 to 2345°C)
Detector Type / Image Pixels	Uncooled Silicon Focal Plane Array / 656 x 494 pixels
Spectral Response	Nominal 0.8 to 1.1 µm
Frame Rate	30 frames / second (Gigabit Ethernet)
Field of View (4x3 format)	55° & 72°
System Temperature Measurement Accuracy	±1% (calibration traceable to National Standards)
Rugged Camera Housing Sealing	NEMA 4 / IP65

Water-Cooled Stainless Steel Camera Housing With Integrated Air Purge)

Length	24in (61cm), 31in (79cm), 36in (914cm)
Diameter	3.5in (88.9mm)
Maximum Furnace Temperature	4250°F / 2345°C
Air Pressure Requirements	10psi / 0.69bar @ 2 SCFM
Water Cooling Requirements	3 - 5 GPM
Maximum Furnace Positive Pressure	3in water gauge / 75mm
Weight	30lb / 13.6kg

System Power Supply / Junction Box

Operating Temperature Range / Sealing	32 to 122°F (0 to 50°C) / NEMA 4 / IP65
Power Requirement	100 to 240V ac 1.0A 50/60HZ
Overall Dimensions	16in x 12in x 8.5in (406mm x 305mm x 216mm)

Lenox Image Processing Software & Computer

Lenox Image Processing Software	Provides display and analysis of thermal images. Enables thermal images to be stored and post processed and provides remote control of camera
Operating System	Windows XP, Vista, or 7
Minimum Hardware Requirements	2.4GHz Processor (or >1.2GHz Duo, 2GB Ram / 1024 x 768 screen

Furnace Camera HD Thermal Imager System Optional Accessories

Automatic Retract System	Pulls Imager back on loss of water cooling or air preventing over-temperature damage
Air Filter System	Includes mounting panel - System removes oil, water, and particulates from air supply
Adjustable Flange	Adjustable mounting flange to align camera housing penetration in refractory wall