

# Infra-View<sup>®</sup> Patented Infrared Boiler / Furnace Thermometers (250°F to 3,000°F Range)

## Principle of Operation

The Infra-View<sup>®</sup> sensor detects the heated CO<sub>2</sub> gas created in a boiler or furnace as a byproduct of the combustion process when fossil fuels are burned, such as coal, natural gas, oil, lignite and orimulsion. The infrared spectral response of the Infra-View<sup>®</sup> sensor is preset specifically to detect CO<sub>2</sub> infrared energy by using a thin film thermopile with a spectral filter designed to block out all other wavelengths of infrared



Infra-View<sup>®</sup> Boiler / furnace Thermometer mounted on large coal fired utility boiler.

emissions. Since the Infra-View detector is sensitive to only the hot CO<sub>2</sub> gas spectrum, it can measure the average, high or low temperature of the CO<sub>2</sub> gas directly within the field of view as it is heated within the specified temperature range.

## Specifications

**Power Requirement:** 24 VDC 4-20 mA integrated loop

**Cooling Requirement:** 15 SCFM (Standard Plant Air)

**Ambient Operating Temp:** 250°F Max.

**Field of View (FOV):** 30:1 (i.e., 3 ft spot @ 90 ft.)

**Response Time:** 100 msec (600 readings/min.)

**Data Output:** Digital 4-20 mA Loop Powered

**Accuracy:** 1% of Reading (Max. Error ± 30°F) NIST Calibration Cert. Avail.

**Measured Temperature Range:** 250°F to 3,000°F

**Infrared Spectral Response:** Heated CO<sub>2</sub> Gas

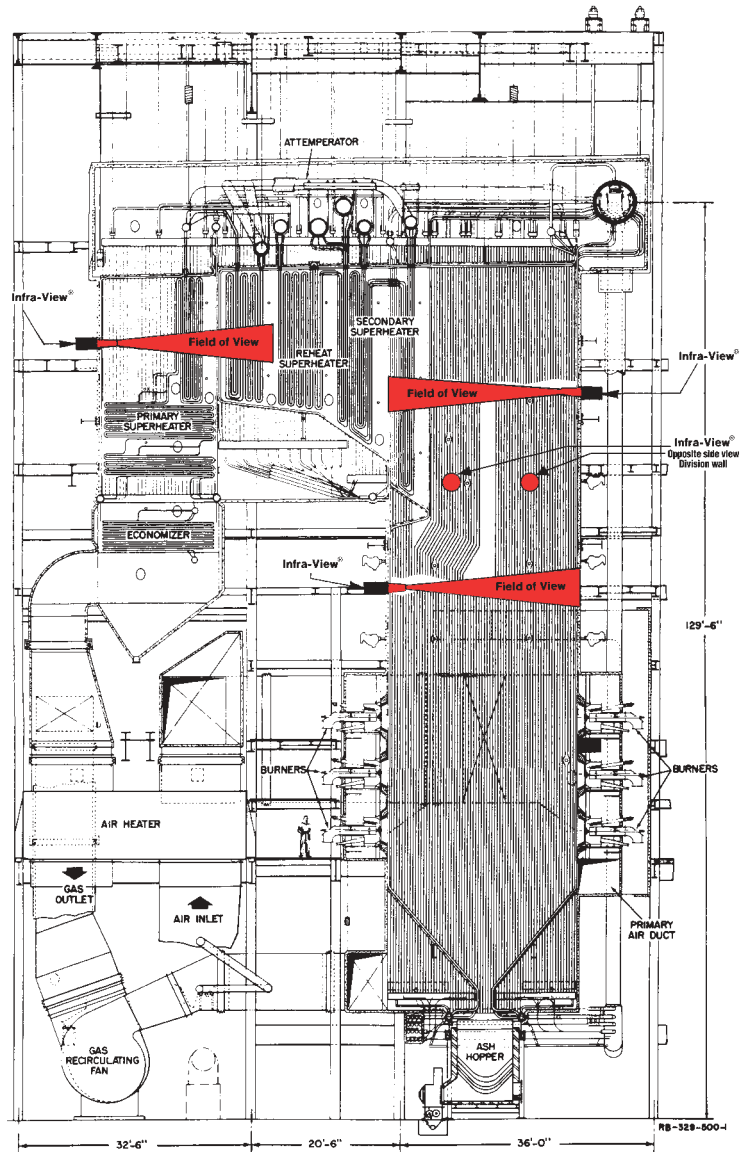
**Weight:** 20 lbs (9Kg) with Infra-View<sup>®</sup> Valve: 24" (61 cm)

**Infra-View<sup>®</sup> Sensor:** Intelligent 2 wire 4-20 mA loop powered digital device that is field addressable utilizing HART<sup>®</sup> protocol preset to specifically detect infrared emissions from heated boiler / furnace flue gas containing CO<sub>2</sub>. On line maintenance and customization can be performed with a laptop or PC with Infra-View<sup>®</sup> Software and HART<sup>®</sup> serial port adapter, anywhere along two-wire loop without data output interference. (Infra-View<sup>®</sup> Software is optional)

### Signal Conditioning / On line Programming Functions

- 1) Peak Hold Mode: Measures highest temperature in FOV and holds reading from 0-10 min.
- 2) Average Mode: Measures average temperature in FOV. Displays updated reading every 0-55 sec. (Stabilizes rapid signal output fluctuations)
- 3) Programmable annunciation alarm set point from 250°F to 3,000°F
- 4) Selectable temperature range (low and high end)
- 5) Fahrenheit or Celsius Outputs (250°F/121°C to 3,000°F/1,649°C)
- 6) Internal Ambient temperature monitoring of sensor to prevent thermal overheating and damage.
- 7) Complete graphing function of temperature vs. time analysis.
- 8) On line temperature data logging function into ASCII database for export to Excel or Lotus 1-2-3 format. Descriptions and tag nomenclatures can be written to sensor memory.

## Infra-View<sup>®</sup>



*Suggested locations for installation of  
Infra-View<sup>®</sup> Boiler Thermometers.*

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# Infra-View<sup>®</sup> Patented Infrared Boiler / Furnace Thermometers (250°F to 3,000°F Range)

## Infra-View Remote Infrared Temperature Sensing

Infra-View<sup>®</sup> Infrared Thermometers are remote sensing infrared detectors that are permanently flange mounted on any port, door or penetration into the boiler or furnace. The Infra-View patented design is supplied with a rugged protective cooling jacket that is factory assembled and pre-piped with an air cooler, purging and filtering system designed to work in most severe service environments. Customer supplied compressed air and two wire shielded signal cable is all that is necessary for operation when integrated in a 4-20 mA signal loop supplied from a DCS, digital or analog recording device. The Infra-View<sup>®</sup> infrared "non-contact" sensor monitors flue gas temperatures in the boiler or furnace ranging from 250°F to 3,000°F (higher end temperature available).



Infra-View<sup>®</sup> Boiler / Furnace Thermometer mounted on boiler with optional air actuated Infra-View<sup>®</sup> Valve designed to open with air purge and spring to close to protect sensor on plant air loss.



Infra-View<sup>®</sup> Boiler Thermometer maintenance and customization being performed with a laptop computer in the field. Sensor programming can be accomplished anywhere along (2) wire loop or at DCS.

## Infra-View<sup>®</sup> Performance & Control Applications

- **Startup Temperature:** Monitor flue gas temperature ramp from 250°F to 1,000°F for boiler startup when bringing the steam turbine online in lieu of retractable temperature probes.
- **Soot Blower Control:** Record time vs. temperature histories to improve boiler performance and control of soot blower operation and duration. Monitor thermal transients during cleaning to improve heat transfer on boiler tubes from under cleaning which could lead to slagging conditions. Monitor boiler gas temperature for comparison to steam outlet temperature for determining soot blower activation.
- **Low NO<sub>x</sub> Applications:** Sense temperature "window" set points between 1,600°F and 2,100°F for injection of low NO<sub>x</sub> enhancers with urea or ammonia in Selective Noncatalytic Reduction Systems.
- **Reduce Ash Fusion/Slagging:** Monitor maximum allowable temperature in the boiler superheat/reheat section for ash fusion alarm point annunciation.
- **High Temperature Alarm:** Monitor highest temperature and maximum load condition for most efficient operation and prevent boiler waterwall, reheat and superheat tube failure.
- **Fluidized Bed Boilers:** Determine optimal temperature for pulverized limestone injection on flue gas desulfurization systems and general operating conditions.
- **Primary Furnace Area (B&W/FW):** Monitor flue gas temperatures in separate sections of boilers with division walls to ensure temperature balance.
- **Fireball Centering (ABB-CE):** Identify fireball centering problems on tangentially fired boilers for control with burner corner dampers.
- **Waste/Refuse Incinerators:** Monitor compliance temperatures for incineration of toxic wastes at 1800°F, Infra-View can be certified to NIST standards.
- **Monitor Black Liquor Temperatures:** The temperature of the gas in the recovery boiler is critical to its efficient operation and performance. Excessive temperatures can cause smelling or cinderling of black liquor particles and can fuse to superheat and reheat tubes thereby decreasing the heat rate of the boiler from plugging of heat transfer surfaces.

Infra-View<sup>®</sup>  
Internet Home Page @  
[www.infra-view.com](http://www.infra-view.com)

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