TEMPSENS
Thermal & Cable Solutions

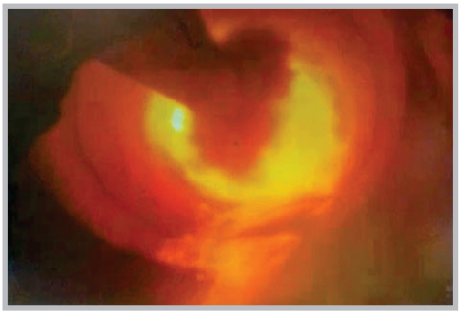
AST
Accurate Sensing Technologies

KILN & COOLER MONITORING CAMERA

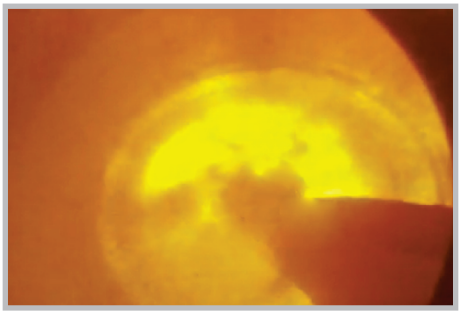
- Optimizes production efficiency and quality.
- Reduces energy consumption and costs.
- Proactively identifies safety hazards.
- Enables timely maintenance and repairs.
- Ensures compliance with regulations.
- Improves overall productivity.
- Prevents kiln and cooler damage.
- Minimizes environmental impact.
- Enables process optimization.
- Increases product consistency.

FURNACE MONITORING CAMERA SYSTEM FOR CEMENT INDUSTRIES.

Kilns and coolers are critical processes in the cement manufacturing process. They are used to produce clinker, which is the primary ingredient in cement. Kilns and coolers are complex pieces of equipment that require precise control and monitoring to ensure optimal production, energy efficiency, and product quality and their efficient operation is essential for the overall success of the cement industry. A furnace monitoring system is a crucial tool that helps to achieve high-quality production output. Kilns and coolers are the major energy-consuming units in cement plants therefore monitoring their operations can help identify areas where energy is being wasted, and where energy-saving measures can be implemented to improve overall energy efficiency. The visual record provided by furnace cameras and other monitoring equipment can aid in troubleshooting and maintenance. Operators can identify trends and patterns that may indicate underlying issues and take corrective actions to address them before they become bigger problems.



Visual View of kiln



Thermal View of kiln

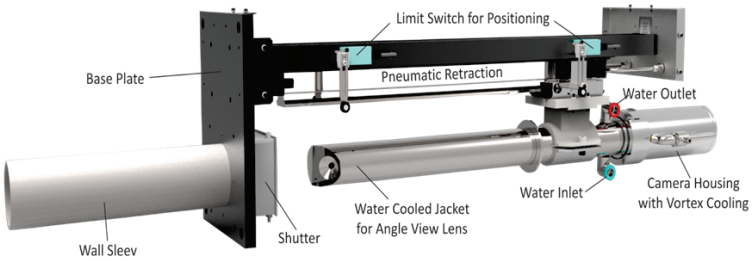
Visual View of Cooler

AST provides two offerings for both kiln and cooler processes: furnace-monitoring thermal cameras (TE series) and furnace-monitoring visual cameras (TFV series).

The AST furnace monitoring thermal camera system is designed to monitor high-temperature environments and detect hotspots, temperature gradients, and other thermal anomalies in real-time. The system uses a high-resolution thermal imaging camera and advanced software to capture and analyze temperature data from the furnace, providing operators with critical information about the condition of the furnace and its components. It also features a user-friendly interface that allows operators to easily view and analyze data, set alarms and alerts, and make adjustments to furnace operation as necessary.

AST high-temperature furnace monitoring visual camera systems provide a wide-angle view of burner flames, material alignment, and other process conditions inside the kiln and cooler.

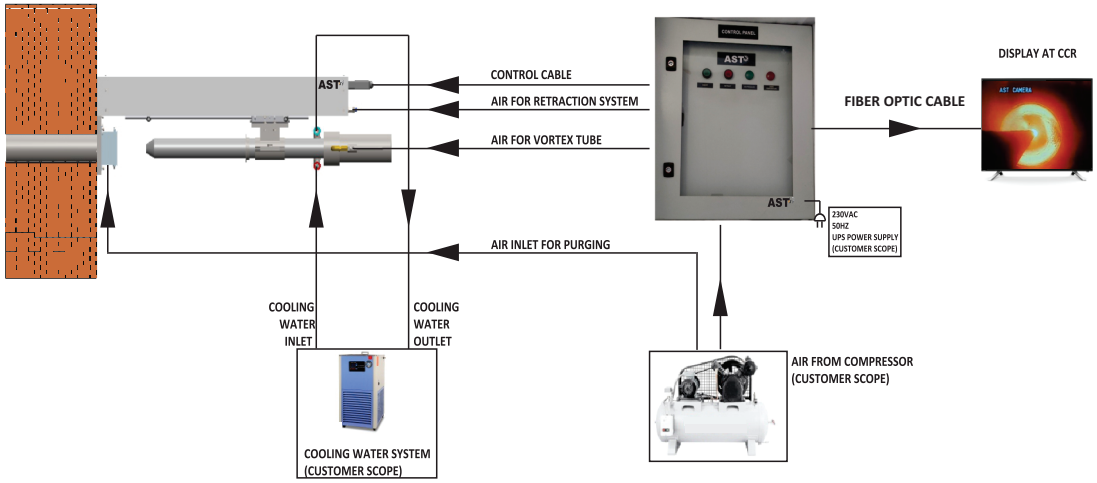
Both system are provided with an auto-retraction and insertion device. In the event of a fault, the probe is automatically removed from the furnace by a retraction device and the furnace opening is closed preventing damage from overheating of probes, cameras, and lenses. The auto-retraction system is regulated by a control cabinet with PCB and a pneumatic control system. It uses a special HD camera with high precision pinhole lens mounted inside stainless-steel probe. The probe is equipped with a vortex air- & water-cooling system that enables the system to work in high-temperature environments & also a continuous supply of air keeps the lens clean.



Camera Installation

The AST furnace monitoring thermal camera is provided with optional OPC protocol which is used in industrial automation to facilitate communication between various software applications and devices involved in the monitoring and control of industrial processes. OPC allows different systems, such as Distributed Control Systems (DCS) and other devices to exchange real-time data with each other. This means that the operator can monitor and control the process from the control room. OPC makes it possible for devices and systems from different manufacturers to work together seamlessly, simplifying the integration and monitoring of industrial processes.

SCHEMATIC DIAGRAM OF CAMERA SYSTEM



Schematic diagram of Camera system.

TECHNICAL SPECIFICATIONS

Requirement of Compressed Air

- Pressure 7 ~ 10 Kg/cm2
- Volume flow 50 m3/h
- Temperature <35°C
- Quality Dust, Oil & Moisture free clean air

Technical

- Environment Up to 2000°C
- Cooling system Vortex air & Water cooling
- Transmission device Pneumatic air cylinder
- Power AC 220V/110 V

Requirement of Cooling Water

- Inlet pressure 2 ~ 5 Kg/cm2
- Volume flow 0.2-1 m3/h
- Quality DM Water

Analog Bullet Camera (Visual)

- CCD sensor 1/3" Super HAD CCD
- Lens 5 times manual electric zoom lens
- Illumination 0.005Lux @F2.0
- Image Manual adjustable
- Power DC12V (±10%)
- Power Consumption Less than 120mA
- Working temperature -10°C ~ +70°C
- Storage temperature -20°C ~ +60°C

Pinhole lens

- Lens length 820 mm
- Focal length Fixed 3.5 mm / from 3.6-18mm.
- Angle of view Straight view 0° Elbow view 60°
- Field of view Horizontal 65° Vertical 56° Diagonal 85°
- Focus and Iris Manual
- Mount CS

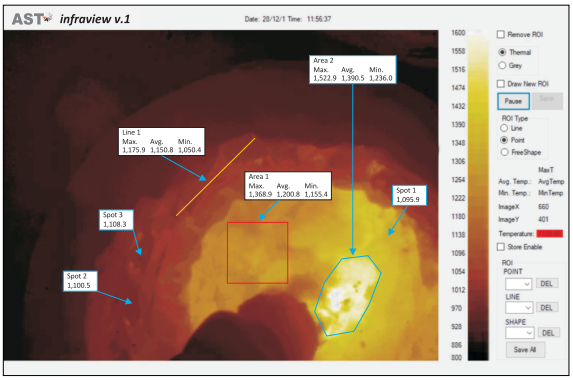
Thermal Camera Specifications

- Temperature Range 700 to 1800°C
- Optical Resolution 640 X 480 Pixels
- Frame Rate 25 Hz
- Detector High dynamic CMOS
- Spectral Range 0.85 to 1.1 mm
- Thermal Sensitivity < 1 K (7 0 0 ° C [< 1 2 9 2 ° F], <2k (1000°C)
- Video format MPEG-4, AV
- Image format BMP/JPG
- Analog Output 4 channel analog current output (4....20mA)
- Digital Input/Output 4 active-high, buffered input / 4 open source, Mosfet outputs
- Interface Ethernet/ USB
- Protocol GigE for ethernet, Proprietary for USB
- Accuracy ±0.3% of measure value ±1°C

GENERAL SPECIFICATION:

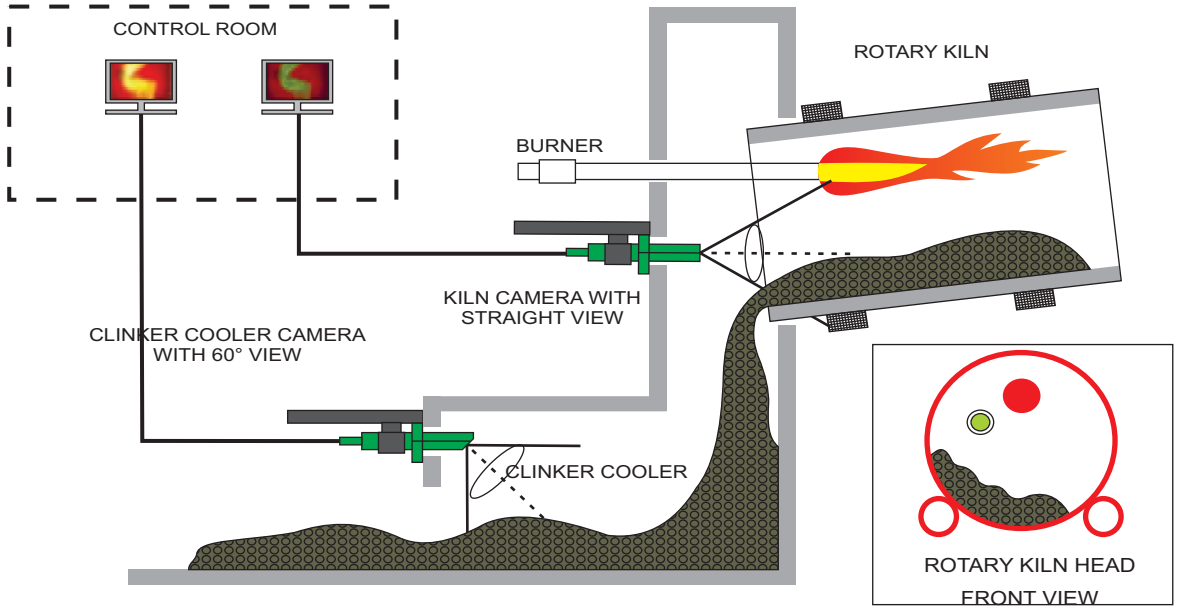
Specifications	TE-750	TE-750 /OV	TFV- 750	TFV-750OV
Application	Kiln	Cooler	Kiln	Cooler
View	Thermal	Thermal	Visual	Visual
Temperature Range	700°C-1800°C	700°C-1800°C	-	-
Viewing pattern	Straight View	Inclined View	Straight view	Inclined view
Angle of lens	-	60°	-	60°
Lens tube length	820mm	820mm	820mm	820mm

InfraView (For Thermal View System)



Special Features

- Configurable ROI's : point, line, free shape
- Histogram and isotherm visualization
- Hot and cold spot detection
- Color pallet scaling
- Trend charts
- Alarm output
- Video and Image export
- Server client configuration



Kiln and cooler camera arrangement

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