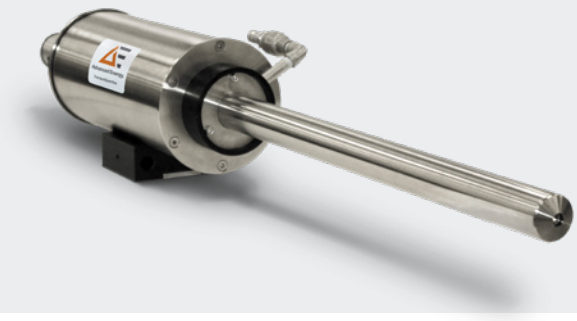
FURNACESPECTION

Infrared camera system for continuous reformer tube monitoring and temperature measurement inside furnaces in refining, glass, and metal processes.



The FurnaceSpection™ thermal imaging system is designed and developed for continuous temperature measurement inside high temperature furnaces in refining, metals, and glass production. FurnaceSpection's proven technology provides critical insight for failure prevention and asset management.

This radiometrically calibrated imager accurately measures the temperature of product, refractory, and heat transfer surfaces inside natural gas fired furnaces. In addition to both standard (SD) and mobile (MB) versions, we can customize a solution to meet your application needs.

PRODUCT HIGHLIGHTS

- Rugged IP66, air or water cooled, protective enclosure
- Accurate 640 x 480 focal-plane array thermal imaging camera with sensitivity of 0.06°C
- Ethernet interface for long distance reliable communication
- Boroscope optics filtered at 0.85 µm wavelength to view through combustion gas and flames
- Auto retraction for SD systems
- Class 1 Div 2 compliant
- Advanced software with simultaneous acquisition from multiple cameras, advanced analysis tools, support for OPC, Modbus (Serial and Ethernet), analog and digital IOs, web service, and archiving
- Complete system integration with installation support

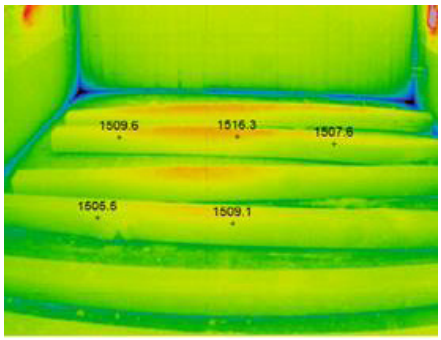


Image of furnace with temp points

Infrared image of inside furnace

FurnaceSpection system setup

OVERVIEW

FurnaceSpection helps operators monitor and control process temperature uniformity through streaming images and powerful software for analysis and historical trending. Digital and Analog outputs are available to broadcast images of the plant's local network.

For petrochemical reformers, FurnaceSpection is a critical tool to ensure tubes perform optimally for their longest possible life cycle. At a cost of several thousands of dollars per tube and a re-tubing costs in the millions, a significant amount of capital can be lost if tube failure goes unnoticed or tubes are retired too early or too late.

In metal annealing applications, FurnaceSpection cameras have allowed users to reduce cycle times while at the same time improving quality and process repeatability.

TECHNICAL DATA

Infrared Camera Specifications	
Wavelength	0.85 µm
Resolution	640 x 480
Detector Type	Silicon based
Acquisition Speed	60 fps (60 Hz)
Protective Housing	IP66
Measurement Range	600 to 1800°C (1112 to 3272°F); 800 to 2200°C (1472 to 3992°F) (water-cooled)
Ambient Environment	Up to 60°C (140°F)
Camera Weight	~10.43 kg (23 lb)

Lens Specifications	
Construction	Stainless steel with air cooling with lens air purge and water cooling (SD)
Field of View (H x V)	55° x 41° or 72° x 54°
Focus	Manual
Protection	Sapphire window tip with air purge shield
Diameter	42 mm (1.65") (Both air and water cooled)

Facility Connection Requirements	
Power	110 to 240 VAC, two 15 amp lines to support six cameras
Electrical Cabinets	All cabinets/panels are NEMA 4 / IP65
Air Supply[1]	15 cfm @ 100 psi @ the camera
	20 cfm @ 20 psi for the lens

Automatic Retraction Device and Mounting (for SD units)	
Controls	Automated retraction if air or power is disrupted
Air Filters	Two-stage filter system
Air Regulators	Included with filter
Mounting	Weld or bolt on mounting plates
Weld-On Thru Hole	64 mm (2.5")
Furnace Pressure	Negative, balanced, or positive pressure

1 Water cooled version does not require air supply

TECHNICAL DATA (CONTINUED)

Networking Specifications	
Number of Cameras	Up to 20 with a single controller (at 1 fps)
Camera Connection	1000 Base T Ethernet
Field Switch Cabinet	NEMA 4 / IP65 enclosure with ethernet switch
Connection to Control Room	Multi-mode or single-mode fiber

FurnaceSpection Control Room Server/Software	
Key Features	Simultaneous acquisition from multiple systems, automated image analysis, support for multiple regions of interest, auto archiving, OPC support, analog/digital IO support, and web server
Server	Single server controls up to 20 cameras (at 1 fps)

REFERENCE NUMBERS

FurnaceSpection SD				
Lens Type	Air Cooled		Water Cooled	
	600 to 1800°C		600 to 1800°C	800 to 2200°C
	45 cm (18")	61 cm (24")	61 cm (24")	61 cm (24")
Standard 55° FOV	912-0009-01	912-0009-02	012-0071-01	012-0071-03
Wide 75° FOV	912-0009-06	912-0009-07	012-0071-02	012-0071-04

FurnaceSpection MB		
Lens Type	Air Cooled	
	600 to 1800°C	
	45 cm (18") straight lens	61 cm (24") straight lens
Standard 55° FOV	012-0021-01	012-0027-01

ACCESSORIES

PN	Description
112-0002-02	FurnaceSpection SD, Wall box for 18" camera
112-0002-02	FurnaceSpection SD, Wall box for 24" camera
812-0003-01	FurnaceSpection SD, Auto retraction device with local controls, power supply for camera and stainless braided air lines
812-0002-01	FurnaceSpection SD, Air filtration system
112-0010-01	FurnaceSpection SD, Standard SD wall mounting plate, Weld-On, 304 Stainless Steel
112-0003-01	FurnaceSpection SD, Standard SD wall mounting plate, Bolt-On, 304 Stainless Steel
912-0055-01	FurnaceSpection MB, Accessory kit (air filtration, hoses, and laptop)

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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